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CATALOGUE

OF THE

AFRICAN PLANTS

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DICOTYLEDONS, PART IV.

LENTIBULARIACEÆ TO CERATOPHYLLEÆ.

BY

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XC. LENTIBULARIACEÆ.

The members of this family produce but little effect on the physiognomy of vegetation in Angola; they, however, especially *Genlisea africana*, adorn with their innumerable mostly purple flowers the humid pastures of the Huilla highlands. Most of the aquatic and even the amphibious species bear yellow flowers, while the strictly terrestrial species are red, violet, purple, or white. In the coast districts only two species are found, and these belong to *Utricularia*. The terrestrial species begin to appear about 3000 ft. above the sea-level in soils that are kept moist even in the dry winter season by the presence of Algæ; they become more frequent and abundant both in species and individuals as the land rises in altitude, and they occur in the largest number of forms and species from 4500 to 5500 ft. The presence of the terrestrial species of *Utricularia* usually indicates a rich productive soil; and even where they grow on a sandy soil, as occasionally happens in Huilla and about Pungo Andongo, their appearance is mostly accompanied with some impregnation of the land with fertilizing materials. Heavy rains are apt completely to wash away the aquatic species, and many of the species suddenly disappear after a few hot and dry days.

1. **UTRICULARIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 987.

1. **U. stellaris** L. f. Suppl. Pl. p. 86 (1781); Oliv. in Journ. Linn. Soc. ix. p. 146 (12 Oct. 1865).

Icolo e Bengo.—In the Lagoa da Funda on the left bank of the river Bengo, in company with *Castalia stellaris* Salisb. and *U. exoleta*; fl. Sept. 1854. No. **268**. In the extensive Lagoa de Quilunda, near Prata, in company with *C. stellaris* and *C. mystica* Salisb., *Lemna*, and *Pistia*; fl. end of Sept. 1854. No. **268***b*.

Barra do Dande.—In the river Dande, the specimens probably grown in Lagoas de Bumbo and washed down; without fl. Nov. 1853. No. **268***c*. An aquatic herb, floating by means of little bladders; rhizome ample; flowers whitish violet or deep purple. In lakes on the left bank of the river Lifune, not far from Banza de Libongo, plentiful; fl. and fr. Sept. 1858. No. **268***d*.

2. **U. reflexa** Oliv., *l.c.*, p. 146.

Huilla.—Rhizomes densely crowded, covering broad tracts of a small river; flowers deep yellow or pale yellow; corolla inside yellow or pale yellow. In the river Quipumpunhime and most of the other gently flowing streams in Sobato de Humpata, about 4800 ft. elevation, very plentiful; fl. April 1860. No. **269**. Same place and date; in fr. No. **269***b*.

3. **U. tricrenata** Baker ms. in Herb., sp. n.

U. sp. n. ?, aff. *U. gibbæ* L., Oliv., *l.c.*, p. 147.

Aquatic; submerged leaves with capillary segments bearing bladders; peduncle slender, naked, 1- or 2-flowered, 1 to 3 in. long; fruiting pedicels divaricate; bracts orbicular, amplexicaul, basifixed; calyx-segments ovate, equal, $\frac{1}{8}$ in. long; corolla $\frac{1}{3}$ in.

long; upper lip orbicular, entire; lower obscurely 2- to 3-crenate; spur as long as the lower lip.

Huilla.—Flowers orange-yellow. At the muddy shore of the great lake of Ivantâla where the river Cacolovar takes its rise, at an elevation about 4000 ft.; fl. end of Feb. 1860. No. **270**.

4. **U. exoleta** Br. Prodr. p. 430 (1810).

U. diantha Schult. Mant. i. p. 169 (1822); Oliv., *l.c.*, p. 147; non Alph. DC.

Icolo e Bengo.—Floating, densely cæspitose; flowers small, pale yellow. In Lagoa da Funda, not far from the river Bengo, plentiful but not then seen elsewhere; fl. and fr. Sept. 1854. No. **267**.

Barra do Dande.—A tender, amphibious herblet, sometimes floating with a much branched rhizome laden with small bladders, sometimes growing on the damp mud with an abbreviated rhizome and without any bladders; flowers deep yellow. At the margins of the river Dande and in neighbouring lakes near Bombo, sparingly; fl. and young fr. Sept. 1858. No. **267***b*.

5. **U. diploglossa** Welw. ex Oliv., *l.c.*, p. 147.

Huilla.—Annual, amphibious, sometimes floating, sometimes terrestrial, with its rhizome and branches bearing crowded bladders and aggregated in the form of cushions; the bladders blackish green or livid purple, large in proportion to the size of the plant, compressedly ovoid, ramentaceous at the top; scape scarcely an inch long, bibracteolate in the middle, 1-flowered, erect at the time of flowering, bent downwards in fruit; corolla yellow, moderate in size; the upper lip 2- or 3-crenulate at the apex, not bifid; the lower lip longer than and twice as broad as the upper, bent downwards, sub-entire and reflected on the margin, as well as the broadly conical obtuse spur furnished beneath with thin scattered hairs; the palate very large and prominent; anthers inserted on the filaments below the apex. In spongy places by streams and in still bays of the streams, in Morro de Lopollo, at an elevation of 5300 ft., plentiful; fl. and fr. middle of May 1860. No. **271**. At the banks of the river Monino. A more densely cæspitose form. No. **271***b*.

6. **U. cymbantha** Oliv., *l.c.*, p. 147.

Huilla.—Corolla pale yellow or straw-coloured, small. Sometimes floating, sometimes terrestrial, in rather shallow pools and covered with various species of Algæ, creeping along mud and forming broad spongy patches; in the more elevated wooded parts of Morro de Lopollo, seen nowhere else; fl. April 1860. No. **272**.

This is the plant referred to as *U. ecalcarata* in Journ. Bot. xxxv. pp. 38, 77, 78, 79, 81, 86, 87, and cf. p. 146 (1897); it formed a harbour for the following fresh-water algæ: n. 179; *Mougeotia* (sp.), *Penium* (sp.), *P. variolatum* West, *P. minutum* Cleve, *Docidium trigeminiferum* West, *Tetmemorus granulatus* Ralfs, *Micrasterias arcuata* Bail., var. *subpinnatifida* West, and *M. tropica* Nordst., var. *crassa* West.

7. **U. subulata** L. Sp. Pl., edit. 1, p. 18 (1753); Oliv., *l.c.*, p. 148.

Huilla.—An annual insignificant little herb; leaves radical, spathulate-lingulate, greatly attenuate at the base; scapes few-flowered, setiform; pedicels spreading-divaricate; flowers yellow; capsules globose, red, resembling the sporogonia of mosses. In damp pastures near Empalanca, on the Humpata plateau, in mossy places

among low bushes, at an elevation of 5500 ft.; fl. and fr. beginning of April 1860. No. **257**.

8. **U. reticulata** Sm. Exot. Bot. ii. p. 119, t. 119 (1 Jan. 1808); Oliv., *l.c.*, p. 149.

Huilla.—A terrestrial marsh herb; root fibrous, the fibres very slender; scape filiform, twining, 1 to 1½ ft. high, 2-flowered; flowers larger than usual, the largest among the Huilla species, deep blue verging on purple; the spur descending, acuminate, but little curved forwards. In marshy somewhat spongy meadows on the left bank of the river Quipumpunhime, in Sobato de Humpata, at an elevation of 4800 ft., very rare; fl. and fr. April 1860. No. **265**.

9. **U. prehensilis** E. Mey. Comm. Pl. Afr. Austr. p. 282 (1837); Oliv., *l.c*, p. 150, excl. var.

Huilla.—An annual herblet; rhizome cæspitose, slender, whitish, brittle, bearing little bladders and also leaves; leaves rather erect, lanceolate or lingulate, attenuate at the long base into the petiole, not uncommonly ending at the apex in a little bladder and there rooting; scapes 3 to 5 in. long, erect, usually aggregated, 1 to 3 together, 2- to 6-flowered; flowers saffron-yellow, the upper lip of the corolla somewhat emarginate at the apex, erect, appendaged at the base on each side at the insertion of the lower lip with a short pyramidal tooth; the lower lip obcordate, patent, deeply marked with four channels on the disk, gibbose-crested; spur conical, somewhat curved forwards. In swampy spongy wooded places in the highest pastures of the Humpata plateau, and in Morro de Lopollo at an elevation of about 5400 ft., in company with *Xyris* and Lycopodiaceæ; fl. and fr. beginning of April 1860. No. **261**.

10. **U. andongensis** Welw. ms. in Herb., sp. n.

U. prehensilis E. Mey., var. *β parviflora* Oliv., *l.c.*, p. 150.

Pungo Andongo.—An annual, elegant herblet; rhizome bearing little bladders and intermixed with mosses and liverworts; leaves broadly linear or lanceolate-linear, obtuse, thinly fleshy, yellowish green; scapes erect, branched; flowers yellowish, unicolorous. In a swampy place at the banks of the rivulet Casālalé in the rugged part of Pedra Songue in the præsidium, rare and observed only in one spot; fl. and fr. Feb., March, and April 1857. No. **264**.

This is not identical with *U. parviflora* Br.

11. **U. tortilis** Welw. ex Oliv., *l.c.*, p. 150.

Huilla.—Terrestrial; fibres of the root whitish, branched, somewhat fleshy; the branches sub-compressed, here and there terminating in little bladders; scape filiform, 2½ to 6 in. long, spirally twining round the stems of Cyperaceæ, 1- to 4-flowered; corolla yellowish; the upper lip entire, longitudinally purple-striate; the lower lip sub-entire, yellow at the gibbosity, whitish-yellowish at the circumference; the posterior lobe of the stigma wanting or obsolete; capsule quite covered by the calyx when nearly ripe. In marshy spongy places in Morro de Lopollo, among short grasses (*Panicum myosuroides* Br., etc.), always in company with mucilaginous algæ and even growing upon them; fl. and young fr. 9 May 1860. No. **258**.

12. **U. linarioides** Welw. ex Oliv., *l.c.*, p. 151.

Huilla.—In habit remarkably resembling some Portuguese species of *Linaria*; leaves radical, obovate-spathulate; petiole long; scape

always strictly erect although weak ; corolla deep purple ; palate yellow-velvety. In spongy places by streams throughout the Lopollo country, appearing soon after the spring rains, at an elevation of 5000 to 5200 ft., plentiful ; fl. and fr. 26 to 30 Oct. 1859. No. **266**.

13. **U. Welwitschii** Oliv., *l.c.*, p. 152.

Huilla.—Scape constantly flexuous on the fruiting portion ; leaves loosely rosulate, elongate-spathulate, rarely surviving on the plant in flower ; calyx-lobes yellowish, margined with red, obtuse, somewhat denticulate on the lower part ; corolla yellow ; both the upper and low lips purplish ; the palate orange in colour ; the spur livid-purple, conical, acute, bent forwards and upwards. In swampy pastures, tolerably plentiful about Lopollo, in company with various species of *Eriocaulon* ; fl. and fr. Nov. and Dec. 1859. No. **263**.

14. **U. firmula** Welw. ex Oliv., *l.c.*, p. 152.

Pungo Andongo.—An annual herblet ; scape erect, simple or bifid, comparatively firm ; leaves radical, rosulate, obovate-spathulate ; upper lip of the corolla yellowish, bilobed ; the lower lip orange-coloured ; the palate deep orange-red ; anthers didymous-constricted. In a damp wooded place among short grasses, near Sansamanda, on the right bank of the river Cuanza, in company with *Isoëtes æquinoctialis*, rather rare and seen only in one place ; fl. and fr. 1 May 1857. No. **262**.

This is not identical with *U. Wallichiana* Wight (v. *firmula*), Oliv., *l.c.*, iii. p. 182 (1859).

15. **U. sanguinea** Oliv., *l.c.*, p. 153.

Huilla.—Leaves spathulate, somewhat fleshy, brittle ; flowers very bright blood-red purple. In swampy pastures and also in damp fields neglected after cultivation about Lopollo, at an elevation of about 5000 ft., very plentiful ; fl. and fr. from Feb. to April 1860. No. **259**.

16. **U. exilis** Oliv., *l.c.*, p. 154.

Huilla.—An annual herblet ; rhizome very tender, whitish, rooting ; leaves spathulate-lingulate, somewhat fleshy, arranged in a rosette at the base of the scape or at each node of the rhizome ; scape 1 to 2 in. high, 1- to 3-flowered, capillary, straight, dusky purple, simple or very rarely with 1 or 2 branchlets ; calyx-segments broadly ovate-elliptical ; corolla sometimes quite white, sometimes more or less violet-purplish ; the upper lip somewhat emarginate or shortly bifid, erect, yellowish, the lower lip gibbous and yellowish in the disk, which is almost quadrate and marked with 3 or 4 deep purple transverse lines on each side, reflected and violet-purple or white on the circumference ; spur horizontal, ascending at the apex, pale purple. In pastures flooded by the spring and autumn rains at length drying up and somewhat spongy, on the Humpata plateau, at elevations of 4800 and 5000 feet, very plentiful, in company with species of *Xyris*, *Eriocaulon lacteum* Rendle (Welw. Herb. 2452), Cyperaceæ, and *Isoëtes* ; fl. 21 March and fr. end of March 1860. No. **253**. A weak, terrestrial herb ; leaves radical, narrowly spathulate ; scape 1- or 2-flowered, 1 to 2 inches high, smooth, erect ; calyx-segments broad ; corolla white, the upper lip incumbent on the margin of the reflected broadly obcordate lower lip ; spur straight, conical, obtuse ; capsule globose, apiculate. In moist bushy sandy flooded places on the point of drying up, between Lopollo and the river Eme ; fl. and fr. middle of April 1860. No. **252**. It also occurred about Lagoa de Quibinda on watery mud, in company with *Rotala mexicana* subsp. *Hierniana* ; see *ante*, p. 371.

Var. **bryoides** Welw. ms. in Herb.

An annual, erect herblet, 1 to 2 in. high; leaves radical, subrosulate, obovate- or lanceolate-spathulate, somewhat fleshy, greatly attenuate at the base into the petiole; scape erect, 1- or few-flowered; flowers purple; corolla pale violet; the palate violet-purple; the disk prominent yellow and marked with purple lines radiating to the circumference. The patches of the plant in fruit resemble those of a fruiting moss.

Pungo Andongo.—In spongy places among the more elevated rocks of Pedras de Guinga, in company with *Ilysanthes andongensis* Hiern, var. ?; fl. and fr. Jan. 1857. No. **254**. In masses rather loosely inserted on rich saturated turf in spongy marshy places, near Catete and Luxillo; fl. and fr. middle of Jan. 1857. No. **255**.

Var. **nematoscapa**.

A filiform herblet with a slender capillary scape and white flowers.

Pungo Andongo.—In sandy places among sparse herbage, by the lake of Quibinda; fl. and fr. March 1857. No. **256**.

This is quoted by Oliver, *l.c.*, p. 155, in mistake as No. 257. It grew in company with *Polygala Welwitschii* Chodat; Welw. Herb. no. 1013.

2. **GENLISEA** A. St. Hil.; Benth. & Hook. f. Gen. Pl. ii. p. 988.

1. **G. africana** Oliv. in Journ. Linn. Soc. ix. p. 145 (1865).

Huilla.—Habit eminently Primulaceous; leaves somewhat fleshy, all densely rosulate; flowers pale purple, turning blue when dried. In marshy meadows and swampy plains by the banks of the Lopollo river, at an elevation of 5000 to 5200 ft., in company with species of *Lobelia* (cf. *L. Welwitschii* Engl. & Diels, Welw. Herb. no. 1142, and *L. angolensis* Engl. & Diels, Welw. Herb. no. 1146), *Burmannia bicolor* Mart., var. *africana* Ridl. (cf. Welw. Herb. no. 6473), and Eriocaulonaceæ (cf. *Pœpalanthus Wahlbergii* Kœrn., Welw. Herb. nos. 2454-55); fl. and fr. Jan. and Feb. 1860. No. **260**. Weaker forms, obtained at the same time and place. No. **260***b*.

The following No., represented in the British Museum set by a poor specimen, should be compared with this species, but the reference is very doubtful:—

Pungo Andongo.—A herb scarcely an inch high, growing in a cæspitose manner, apparently perennial; leaves erect-patent, somewhat fleshy, almost rosulate; peduncles longer than the leaves; fruit fallen. In rocky sandy-schistose places on the right bank of the river Cuanza: without fl. end of Jan. 1857. No. **6743**.

XCI. GESNERACEÆ.

1. **STREPTOCARPUS** Lindl.; Benth. & Hook. Gen. Pl. ii. p. 1023.

1. **S. monophyllus** Welw. in Archiv. Sc. Phys. & Nat. Genève, xi. p. 202 (1861), (*monophylla*).

S. benguelensis Welw. ex C. B. Cl. in DC. Monogr. Phan. v. 1, p. 150 (1883).

Huilla.—A herb, apparently perennial; radical leaf solitary, very large, very broadly cordate-ovate or cordate-oblong, obtuse at the apex,

bright green, coarsely wrinkled and velvety-pubescent above, whitish-shaggy scrobiculate and with thick pinnate nerves spreading beneath, at length fleshy-thickened near the base, lying close to the ground; stem very short, fleshy, thickened, dichotomously or trichotomously divided a little above the crown of the root into purple scape-like somewhat thick rigid several-flowered occasionally foliate branches; flowers handsome, somewhat nodding, as large as those of a foxglove, violet-blue, some cauline, others solitary near the central stem from the crown of the root: calyx deeply 5-cleft, scarcely 5-phyllous, short; its lobes $\frac{1}{6}$ in. long: corolla tubular-funnelshaped, sub-bilabiate, the segments of the limb obtuse; stamens 4, included, the posterior ones sterile; the filaments narrowly clavate, those of the interior stamens incurved; anthers sub-reniform, cohering; ovary 1-celled, in form like the spike of a *Myosurus*; placentas many-ovuled; style firm, cylindrical; stigma capitate-peltate, the apex thinly papillose, not bilabiate nor with reniform lobes; capsule elongate-cylindrical, $1\frac{1}{4}$ to 2 in. long; the valves 2, spirally twisted together; seeds very numerous and small. On rocky declivities close to the banks of the river Monino in Morro de Monino, by rocks thinly covered with soil, at an elevation of 5300 to 5600 feet, rather rare; fr. and very few fl. 10 and 12 May 1860. No. **1660** and Coll. Carp. 36 (not found) and 821.

This species differs from *S. Cooperi* C. B. Cl., *l.c.*, by the presence of pubescence on the exterior of the corolla; it may be identical with a plant collected by Buchanan in 1891, n. 882, in Nyasaland. The solitary radical leaf is regarded as a persistent cotyledon; see Crocker in Journ. Linn. Soc. v. p. 65, t. 4 (1860) and Dickie, *l.c.*, ix. p. 126 (1865).

XCII. BIGNONIACEÆ.

The species of Bignoniaceæ found by Welwitsch in Angola and Benguella are in great disproportion to the total number, which amounts to between 500 and 600; this contrast is the more striking, because tropical countries in other parts of the earth form the principal seat of this Order.

1. **STENOLOBIUM** D. Don in Edinb. Phil. Journ. ix. p. 264 (1823).

Tecoma Juss., sect. Tecomaria, Benth. & Hook. f. Gen. Pl. ii. p. 1044.

1. **S. stans** Seem. Journ. Bot. i. p. 88 (1863).

Bignonia stans L. Sp. Pl., edit. 2, p. 871 (1762). *Tecoma stans* Spreng. Syst. Veg. ii. p. 834 (1825).

Sierra Leone.—A subscandent shrub, as tall as a man; flowers yellow. Cultivated in gardens at Freetown; fl. Sept. 1853. No. **484**.

2. **NEWBOULDIA** Seem.; Benth. & Hook. f. Gen. Pl. ii. p. 1045.

1. **N. lævis** Seem. (Journ. Bot. 1863 p. 225, and 1870 p. 337); Bureau, Monogr. Bign. t. 15 (1864).

Spathodea lævis P. Beauv. Fl. d'Owar. i. p. 48, t. 29 (1805?). *Bignonia africana* Lam. Encycl. Méth. i. p. 424 (1783).

Island of St. Thomas.—In the mountainous parts of elevated primitive forests, at Fazenda de Monte Caffé; fl.-bud Dec. 1860. Native name "Quimé." Represented in the British Museum by some fragments and a drawing of the specimen copied from the study set. No. **1259**.

3. **SPATHODEA** P. Beauv.; Benth. & Hook. f. Gen. Pl. ii. p. 1045.

1. **S. campanulata** P. Beauv. Fl. d'Owar. i. p. 47, t. 27 (1805?); Seem. in Journ. Bot. iii. p. 332, t. 40 (1865); Welw. Apontam. p. 584, n. 6 (1859). *Bignonia tulipifera* Thonn. in Danske Vid. Selsk. iv. p. 47 (1829). *S. tulipifera* G. Don, Gen. Syst. iv. p. 223 (1837).

Libongo.—A tree of moderate size, with the habit of an ash; leaves pinnate, deep green; flowers racemose-cymose, red-orange in colour, campanulate, a little larger than even a very large tulip. In the more elevated forests of the interior part of the district, very rare; fr. Sept. 1858. Coll. Carp. 814.

Cazengo.—A tree; leaflets mostly much larger and flowers half as large as those respectively in No. 486. In the primitive forest at the bank of the river Luinha, near Aguas Doces, during heavy rain; fl. 31 Dec. 1854. No. 487.

Golungo Alto.—A handsome tree, when in flower one of the most beautiful in Angola, 20 to 30, usually 20 to 25 ft. high, with the habit of the common ash; leaflets with a blackish gloss; flowers very large and crowded, scarlet, golden-coloured and somewhat crisp on the margin; fruit lance-shaped, erect. In the less dense damp woods by the banks of streams, plentiful, nearly throughout the district, flowering from September to the end of May, fruiting in June and July; near Sange, N-delle, Cambondo, Trombeta, and around Bango, fl. March 1856, fr. June 1855, at 2400 feet alt. No. 486. By the Menha Lula road; seeds August 1855. Coll. Carp. 813.

It is not uncommon in the district of Ambaca. In the primitive forests of Golungo Alto, in Sobato de Mussengue, it attains 70 ft.: it is called "Muten-andûa" or "N-denand" or "Mangel-andûa" or "Mutenguenandúa" or "Andenandúa." Also in Pungo Andongo.

4. **MARKHAMIA** Seem. Journ. Bot. 1863, p. 226.

Muenteria Seem., *l.c.*, 1865, p. 329. *Dolichandrone* sect. Markhamia, Benth. & Hook. Gen. Pl. ii. p. 1046.

1. **M. stenocarpa** K. Schum. in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 242 (July 1894).

Muenteria stenocarpa Seem. Journ. Bot. 1865, p. 329, t. 36. *Spathodea stenocarpa* Welw. ex Seem., *l.c.* *Dolichandrone stenocarpa* Baker in Kew Bull. 1894, p. 31.

Golungo Alto.—A moderate-sized tree, 20 to 25 ft. high; crown dilated, frondose; branches patent; branchlets tortuous; flowering panicles erect; flowers white or yellow, variegated with a rose or violet colour; fruit 1 to 1½ ft. long, linear, falciform. In dense primitive forests at the river Luinha, also as a small tree in secondary woods near Cambondo, sporadic and occasional throughout nearly the whole district: fl. and fr., Jan. and Feb. 1855, over-ripe fr. Dec. 1854. No. 482.

Pungo Andongo.—A stately, leafy tree, 15 to 20 ft. high or more: branches spreading; branchlets ashy, much compressed at the nodes, bearing frequently drooping flowers; leaves opposite, imparipinnate, trijugate, the terminal leaflet the largest: corolla smaller than in *Spathodea*, greenish sulphur in colour outside, deep sulphur inside, marked with longitudinal blackish purple lines and points: the lobes of the limb very crisp on the margin, dusky purple inside and beset with large round glands which somewhat resemble the yellow-margined apothecia of *Lecidea*: stamens 5, one of them short and rudimentary:

capsule about a foot long, but little exceeding $\frac{1}{6}$ in. in breadth, curved in a falcate manner, nearly smooth ; seeds as in *Spathodea*. In the deep valleys among the gigantic rocks of the præsidium, in the forest of Mata de Cabondo and near Luxillo, not uncommon ; fl. and young fr. Dec. 1856 and Jan. 1856. No. **483**.

1. **M. tomentosa** K. Schum., *l.c.*, p. 242.

Spathodea tomentosa Benth. in Hook. Niger Fl. p. 462 (1849). *Muenteria tomentosa* Seem., *l.c.*, p. 330, t. 35.

Golungo Alto.—A small tree, 8 to 10 ft. high, or oftener only a shrub of 5 to 6 ft., always sparingly branched and strictly erect ; capsule 2 to $2\frac{1}{2}$ ft. long. In bushy places at the outskirts of the primitive forests of which it is a remarkable ornament, sporadic ; near Sange at the base of Serra de Alto Queta ; fl. Feb. fr. June 1855. No. **485**. A tree, in primitive forests 30 ft. high or in secondary thickets only 6 to 8 ft. ; branches rambling, lax ; flowers yellow-orange, very handsome. In the forests and thickets, frequent throughout the mountainous parts of the district ; in the elevated primitive forests among the mountains of Cungulungulo ; fl. and ripe fr. Nov. 1855. No. **485***b*. A small tree ; leaves pinnate ; flowers densely spicate, large, saffron-yellow ; capsules 2 to 3 ft. long, outside cinnamon-tomentose. At Sange ; fr. July 1857. Coll. Carp. 815.

Some fragments of the fruit of *M. stenocarpa* are intermixed with the fruit of this species in Coll. Carp. 815 ; the description attached appears to belong exclusively to this species.

"Moluânda" is the native name of a tree, belonging to *Spathodea* or an allied genus ; it has sulphur-coloured flowers and capsules a yard long ; the wood is strong and is generally used by the Golungo Alto negroes for the helves of pruning-hooks ; perhaps it belongs to this species.

5. **FERDINANDIA** Welw. ex Seem. Journ. Bot. 1865, p. 330, t. 37–38 ; non *Ferdinanda* Lagasca (1816) ; nec *Ferdinandea* Pohl (1827).

Fernandoa Welw. ex Seem., *l.c.*, 1866, p. 123. *Ferdinandoa* Seem., *l.c.*, 1870 p. 280. *Ferdinanda* Welw. ex Benth. & Hook. f. Gen. Pl. ii. p. 1047 (1876). *Heterophragma* Benth. & Hook. f., *l.c*, p. 1046, partly ; non DC. *Fernandia* Baill. Hist. Pl. x. p. 47 (1888) ; K. Schum. in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 243 (1894).

1. **F. superba** Welw. ex Seem., *l.c.*, iii. p. 330, t. 38 (1865).

Bignonia Ferdinandi Welw. Apontam. p. 584, n. 10 (1859). *Ferdinandoa superba* Seem., *l.c.*, 1870, p. 280. *Fernandia superba* Baill., *l.c.*, p. 48. *Heterophragma Ferdinandi* Britten, Journ. Bot. 1895 p. 75. *Fernandia Fernandi* K. Schum. in Engl. Nat. Pflanzenfam. iv. 3*b*., p. 243, fig. 92, g. (1895).

Golungo Alto.—An extensive tree, 25 to 40 ft. high, almost leafless at the time of flowering, a very beautiful ornament of the Angolan flora, patently branched a little above the base ; head densely leafy, broad, depressedly ovoid ; all the branches, even the lower thicker ones, and the shoots of the year covered with flowers ; leaves opposite, imparipinnate, 3- or 4-jugate, appearing immediately after the flowering ; flowers handsome, very large, fasciculate, orange-cinnabar in colour, striate with blood-red lines ; calyx globose-campanulate, inflated, bursting into 3 or 4 unequal teeth with a loud crackling, shortly

velvety outside with a violet-purple felt, obscurely quadrangular at the base; corolla campanulate-subbilabiate, inserted at the bottom of the calyx around the yellowish hypogynous disk; stamens 5, four of them almost equal in height and bearing anthers, the fifth much shorter and without an anther; ovary sessile, cylindrical-fusiform, surrounded with the fleshy disk and also a little imbedded in it, hispid-tomentose outside, apparently bilocular; the ovuliferous placenta usually almost entirely free in the cavity of the ovary; style filiform, bilamellate at the apex, the lamellæ usually cohering by their inner faces; capsules pendulous, 1½ ft. and upwards, often 3 ft. long. In the bushy wooded parts of the primitive forest in Sobato de Bumba, at the base of Serra de Alto Queta, at an elevation of 2200 ft., rather rare, in company with *Intsia cuanzensis* O. Kuntze (Welw. Herb. no. 628) and *Oncoba Welwitschii* Oliv. (Welw. no. 537); fl. Nov. and Dec. 1855, and Feb. to April 1857; leaves fully open Jan. 1857; fr. beginning of July 1857. No. **488** and Coll. Carp. 817. Capsules cylindrical-subulate, spirally twisted-angular, 2 ft. long, as thick as a man's finger. At Sange; fr. beginning of Jan. 1856. Coll. Carp. 816.

This plant was named in honour of Senhor Dom Fernando, king of Portugal, who constantly favoured and encouraged Welwitsch in his travels in Angola.

6. **CATOPHRACTES** D. Don; Benth. & Hook. f. Gen. Pl. ii. p. 1048.

1. **C. Welwitschi** Seem. Journ. Bot. 1865, p. 331, t. 39.

Bumbo.—Stem and leaves clothed with a snow-white felt; the young branches often spineless, the old ones armed with long spines; flowers milk-white in the living state. About 15° S. Lat., in mountainous bushy rocky and gravelly places, about 60 geographical miles from the ocean, at an elevation of 1000 to 1200 ft., only between Pomangala and Quitibe, tolerably plentiful; fr. and few fl. June 1860. No. **490**. A sarmentose, spiny shrub, 5 to 7 ft. high. Near Pomangala; fr. Oct. 1859. Coll. Carp. 818. A shrub as tall as a man, branched from the base; leaves more or less spathulate, silvery-tomentose, dentate; flowers white; corolla-tube long; stamens 5. In dry hilly places between Quitibe and Pomangala, plentiful; fl. and fr. beginning of June 1860. Coll. Carp. 819.

Bentham & Hooker, *l.c.*, p. 1049, unite this with the original species of the genus, *C. Alexandri* D. Don in Trans. Linn. Soc. xviii. p. 308, t. 22 (1840).

7. **KIGELKEIA** Rafin. Sylva Tellur. p. 166 (1838).

Sotor Fenzl in Ber. xxi. Versamml. Deutsch. Naturf. 1843, p. 168 (1844). *Kigelia* DC. Prodr. ix. p. 247 (1845); Benth. & Hook. f. Gen. Pl. ii. p. 1053.

1. **K. pinnata.**

Crescentia pinnata Jacq. Collect. iii. p. 203, t. 18 (1789). *Tanæcium pinnatum* Willd. Sp. Pl. iii. p. 312 (1801). *Tripinnaria africana* Spreng. Syst. ii. p. 842 (1825). *Sotor æthiopicum* Fenzl, *l.c.* *Kigelia pinnata* DC., *l.c.*; Seem. Journ. Bot. 1865, p. 333.

Golungo Alto.—A tree, 10 to 35 ft. high; trunk 6 to 30 in. in diameter at the base, in the smaller trees 2 or 3 times divided into branches at the height of 5 to 7 ft.; branches erect-spreading, loosely leafy; branchlets compressed about the nodes; leaves opposite, multijugate; flowers paniculate, very handsome, conspicuous from afar,

especially those on the lower branches, which are always more abundant and larger than the upper ones, on account of their orange-scarlet colour; peduncles drooping-pendulous from the uppermost axils; the common peduncle 1 to 2 ft. long, much flattened-dilated above towards the insertion of the pedicels, striate; pedicels subverticillate, dichotomous, recurved upwards, thick, very rigid; calyx fleshy-coriaceous, green, tubular-campanulate, variously cleft or bilabiate, the upper lip a little narrower and longer than the lower, both lips rounded or very obtuse, quite entire, with a narrow scarious blackish membrane at the margin, the lower lip supplied outside with round irregularly arranged glands; corolla coriaceous (except the lobes), rigid, smooth outside, brittle, orange-scarlet or pale red outside, deep scarlet or orange-cinnabar inside, ringent; the lower part of the tube funnel-shaped, yellowish both inside and out, constricted a little above the base, then abruptly dilated and curved; the limb very wide, bilabiately 4-cleft, that is, the upper lip slightly bifid and the lower lip more deeply trifid, all the lobes repand-dentate on the margin, somewhat obtuse, corrugated-crisp or plicate-undulate, scarcely ever fully expanded, scrobiculate-veiny on the inner face; the three lower lobes subequal, long, with a thick nerve and longitudinally striate; stamens 5, inserted at the middle of the corolla-tube where it is constricted and curved forwards, included, 4 of them didynamous and fertile, the fifth 3 or 4 times shorter sterile and without an anther; filaments cylindrical, yellowish, but little attenuate towards the apex, thinly hirsute with whitish hairs at the base; anthers large, yellowish, attached at the apex, 2-celled, the cells longitudinally dehiscing and divaricate in a sagittate manner: the sterile stamen placed between the two shorter fertile stamens and corresponding to the cleft or sinus of the upper lip of the corolla; disk perigynous, thick, yellowish, fleshy, turgid, annular, smooth, lying at the bottom of the calyx and surrounding the base of the ovary; ovary sessile at the bottom of the calyx, conical-cylindrical, 2-celled, the cells many-ovuled; style elongated, exceeding the stamens, cylindrical, flattened towards the apex; stigma consisting of two ovate-lanceolate lamellæ stigmatose on the inner face; fruit pendulous, conical-cylindrical, 1 to 1½ ft. long, 2 to 3 in. in diameter, green, somewhat warted, a little compressed on two sides, more or less dusky when ripe; seeds numerous, not winged, nestling in pulp which is pervaded with woody fibres. The fifth stamen is always present, and in only one instance out of more than fifty flowers examined was it found fertile. At the outskirts of primitive forests, especially by streams in Sobatos de Bumba and Bango Aquitamba, and about Sange by the Delamboa rivulet; fl. May to Dec., fr. Jan. to April 1854-56. No. **489**. In company with *Tylophora conspicua* N.E. Br.: Welw. Herb. no. 4215. In damp woods at the river Muia, near Trombeta: fl. June 1856. A form with much more ample leaflets. No. **491**. Flowering and fruiting racemes pendulous; ripe fruit 18 to 20 in. long by 2½ to 3 in. in transverse diameter. In Mata de Quisucula, at the river Delamboa; fr. Oct. 1855. Coll. Carp. 820.

The Mozambique vernacular name is "Kigeli-Keia"; in Bango it is called "Cambumbi."

XCIII. PEDALIACEÆ.

These plants Welwitsch regarded as forming groups of Bignoniaceæ; in contradistinction to the latter they are well represented in Angola and Benguella, and indeed are more frequent

than in other tropical countries; but as they consist mostly of herbs they do not greatly affect the physiognomy of the vegetation.

The tribe Pedalieæ has only one representative in the collection, and of that one only a single specimen was found; but it is very probable that *Uncaria procumbens* Burch., the grapple plant, occurs in the southern part of Mossamedes on the sandy Cunene plains.

The tribe Sesameæ is most frequent about Benguella and in the Mossamedes district. Two species of *Sesamum*, namely, *S. angolense* and *S. rigidum*, have both opposite and alternate leaves on one and the same specimen. The cultivation of *S. orientale*, which is carried on with profitable results in India, Egypt, Mozambique, etc., was started in Angola during the time when Pedro Alexandripho do Conha was governor-general, and again at a later period before Welwitsch's time, though always with but small success; but the experiments appear not to have been made in the parts of the province best adapted for the purpose. The colonists complained that the exceedingly irregular ripening of the seeds so reduced the crop that the cultivation of this oil-plant had resulted in a loss; during the latter part of his travels, however, Welwitsch saw in the interior, chiefly on the high plateau east of Pungo Andongo, the plant cultivated by the negroes, though only in small quantities and for their own use, and he was firmly convinced that trials made by experienced colonists and in properly chosen districts in the highlands would lead to favourable results. The negroes of Pungo Andongo cultivate it, not for the extraction of oil, but for making cakes, which they bake with the crushed seeds, and which they look upon as a delicacy. In Cazengo the cultivation had been attempted and given up, as it was found that birds devoured the seeds of the Sesamum before they ripened, and that *Arachis hypogæa* afforded a far more certain and profitable yield for the production of oil.

Several species possess roots containing a red dyeing material, which even in the herbarium stains paper, and they might perhaps be used for dyeing purposes; this material is most strongly developed in *Sesamum triphyllum*, a species which is widely distributed from the banks of the Maiombo behind Mossamedes up to the high plateau of Huilla. A mucilaginous infusion is obtained from species found about Lopollo and Huilla. *S. pentaphyllum* with its large violet-purple flowers, and still more so the *S. angolense* of Pungo Andongo, are very ornamental plants, and probably might, at least in the warmer European countries, be grown in the open air.

1. **PTERODISCUS** Hook.; Benth. & Hook. f. Gen. Pl. ii. p. 1057.

1. **P. aurantiacus** Welw. in Trans. Linn. Soc. xxvii. p. 53 (1869); Schinz in Verh. Bot. Brandenb. xxx. p. 181 (23 June 1888).

Mossamedes.—A decumbent herb, glaucous-pruinose beneath; root thick, fusiform, almost napiform; stem prostrate, succulent, nearly

glabrous ; branches opposite ; leaves obovate- or oblong-spathulate, fleshy-thickish, succulent, rounded-obtuse at the apex, gradually narrowed at the base into the petiole of ½ to 1¼ in. long, repand or sinuate-dentate on the margin, densely glandular-lepidote on both faces ; flowers axillary, solitary, scarcely an inch long ; corolla between funnel- and salver-shaped, of a bright deep orange colour ; the tube cylindrical, ½ in. long, ⅛ in. in diameter ; the limb 5-lobed, spreading, sub-bilabiate ; stigma deeply bilobed ; fruit drooping, ovoid-pyramidal, 4-winged ; the wings semicircular, broad, radiately plicate, scarious, entire on the margin. In a sandy place at the banks of the river Bero near Mossamedes; only one old specimen ; fl. and fr. July 1859. No. **1658**.

2. **ROGERIA** J. Gay ; Benth. & Hook. f. Gen. Pl. ii. p. 1057.

1. **R. adenophylla** J. Gay in Ann. Sc. Nat., ser. 1, i. p. 457 (1824).

Mossamedes.—An annual herb, 1 to 1½ ft. high ; flowers handsome ; corolla orange in colour outside, the interior of the tube and the whole limb felted with a pale purple velvet ; capsule many-sided, scarcely quite 4-celled, beaked with the remains of the style, the beak obliquely truncate ; testa of the seeds deeply foveolate or scrobiculate. At the rocky bank of the river Bero, among tall bushes, fl. and fr. Aug. 1859, and at the bank of the river Maiombo in Oct. 1859 : one specimen in each place. No. **1657**. A herb of 2 to 3 ft. ; leaves glaucous ; flowers large, Bignonioid, glaucous-purple. At Pedra do Rei, near Boca do Bero ; one specimen ; fr. Oct. 1859. A plant well worth cultivating. Coll. Carp. 42.

The plant affords a mucilaginous infusion which is useful in cases of diarrhœa, etc.

3. **SESAMOTHAMNUS** Welw. in Trans. Linn. Soc. xxvii. p. 49 (1869) ; Benth. & Hook. f. Gen. Pl. ii. p. 1058.

1. **S. benguellensis** Welw., *l.c.*, p. 50, t. 18.

Bumbo.—A much-branched, spiny, arborescent shrub as tall as a man, or rather a shrubby tree, leafless during the greater part of the year, sparingly flowering, more sparingly and only in copiously rainy years fruiting ; trunk 1 to 3 ft. in diameter, at the height of scarcely 1½ ft. divided into 3 to 7 tortuously ascending branches as thick as a man's arm ; bark of the trunk from whitish to ashy, smooth, here and there horizontally rugulose ; branches irregularly ramulose : branchlets erect-patent, very crowded ; twigs spinescent, bearing on their axils leaf-buds wrapped in short whitish wool, floriferous below the apex ; leaves sub-fasciculate in the axils of the spines, obovate-oblong, glaucous-green, somewhat fleshy and rigid, very obtuse and mucronate with a slender seta at the apex, narrowed at the base into the petiole, opening a little after the flowering, falling soon afterwards, articulate ; base of the petiole persistent on the stem and remaining in the form of a spine always truncate at the apex ; flowers handsome ; corolla from whitish to rosy outside ; the tube elongated, with a long spur at the base ; the spur conical-lanceolate, almost an inch long ; the limb spreading, 5-lobed, white or milk-white ; fruit dusky black, almost like that of a *Sesamum*. In rocky mountainous sparingly bushy places in Serra da Cazimba, on dry hills composed of a sandy schist, between Cazimba and Quitibe, at an elevation of 600 to 1000 ft., sporadic ; with a few fl.-buds and a simple open fl. Oct. 1859, in company with *Hoodia parviflora* N.E. Br. (Welw. Herb. no. 4265) and *Cotyphractes*

Welwitschi Seem. (Welw. Herb. no. 490) : near Cazimba, plentiful, ripe fr. and but few leaves 5 June 1860. No. **1509**.

The plant is used medicinally as a demulcent and refrigerant in cases of inflammation of the face, mouth, eyes, and urinary passages.

4. **SESAMUM** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1058.

1. **S. orientale** L. Sp. Pl., edit. 1, p. 634 (1753).

S. indicum L., *l.c.* ; Welw. Apontam. p. 551, sub n. 103 (1859) ; Ficalho, Pl. Uteis, p. 237 (1884). *Anthadenia sesamoides* Van Houtte in Hort. Vanhoutt. fasc. i. p. 4 (1845). *Volkameria orientalis* O. Kuntze, Rev. Gen. Pl. ii. p. 481 (1891). *V. sesamodes* O. Kuntze, *l.c.*, p. 482.

Libongo.—An annual, erect, branched herb, 1½ to 4 ft. high : corolla pale rosy purple. In moist bushy places on the left bank of the river Lifune, here and there ; fl. and fr. end of Sept. 1858. No. **1639**.

Cazengo.—Seeds dusky yellow. Among low scattered bushes near Cacula, in company with *Ceratotheca integribracteata* Engl. (Welw. Herb. no. 1649), not uncommon : fl. and fr. June 1855. No. **1640**.

Golungo Alto.—Seeds black. In bushy wooded places on a sandy clay soil at the banks of the river Cuango, near Sange ; fl. and fr. July 1855. No. **1638**.

Pungo Andongo.—In moist sandy places at the river Cuanza, near Sansamanda ; fl. and unripe fr. Dec. 1856 ; also in neglected fields covered with bushes near Condo ; fr. March 1857, mostly very sporadic. No. **1641**.

No. **1642** is a specimen of the same species from G. Don's herbarium obtained at Sierra Leone, where it is called "Kinu Thorny" or "Palaver sauce plant."

In Angola native names are "N-guilla," "N-gilla," "Anguilla," "Uanguilla," "Ricola," and "Ocoto" ; the Portuguese name is "Gergelim."

2. **S. calycinum** Welw. in Trans. Linn. Soc. xxvii. p. 52 (1869) ; Engl. Bot. Jahrb. xix. p. 158 (1894).

S. indicum L., var. ? *angustifolium* Oliv. in Trans. Linn. Soc. xxix. p. 131 (1875). *Volkameria calycina* O. Kuntze, *l.c.*, p. 482.

Pungo Andongo.—Stems 2 to 3 ft. high, erect, simple or usually divided towards the apex into 3 to 5 elongated virgate branches ; leaves half as large as those of *S. angolense*, lepidote beneath between the purple veins with white depressed scales, each of which consists of four connate obtusely quadrangular parts ; flowers rosy purple, secund, drooping, ¾ to nearly 1½ in. long ; calyx-lobes linear-lanceolate, with a very long acumen at the apex ; capsule gradually attenuate at the apex in a long acumen ; seeds nearly similar to those of *S. angolense*. In the drier sandy thickets between Caghuy in the præsidium and Sansamanda ; fl. and few fr. beginning of Jan. 1857. No. **1644**.

3. **S. angolense** Welw. Apontam. p. 588, n. 59 (1859), and in Trans. Linn. Soc. xxvii. p. 51 (1869) ; Engl. Bot. Jahrb. xix. p. 158 (1894).

S. macranthum Oliv. in Trans. Linn. Soc. xxix. p. 131, t. 84 (1875). *Volkameria angolensis* O. Kuntze, *l.c.*, p. 482.

Pungo Andongo.—A suffruticose herb, 3 to 5 or rarely 6 ft. high :

stem straight, sparingly branched towards the top ; leaves obovate-oblong, the upper ones obcuneate, all obtuse and more or less emarginate at the apex, membranous, somewhat rigid, deep green and rugulose above, clothed beneath with a lax or rather dense adpressed whitish felt or hoary with a loose coarse tomentum ; flowers very large and handsome, brilliantly purple or rosy violet, very like a foxglove, drooping ; seeds obovate, 4-edged, delicately reticulate-wrinkled on the faces. In sandy woody thickets between the streams Lutete and Luxillo, near Fundo de Cazella, fl. and unripe fr. 18 Oct. 1856 ; from Cazella to the right bank of the river Cuanza, Catete, etc., fl. and fr. beginning of Jan. 1857 ; also near Lombe, very sparingly, fl. and fr. March 1857. No. **1645**, and Coll. Carp. 169.

This is the *Sesamum*, which, "far surpassing all other herbaceous plants in splendour, size and richness of blossoms, appears prominently in all the less dense places of the wood" ; see Welw. in Journ. Linn. Soc. iii. p. 153 (1859).

4. **S. digitaloides** Welw. ex Schinz in Bull. Herb. Boiss. iv. p. 454 (1896).

Mossamedes.—An annual or biennial herb, erect, 4 to 5 ft. high, divaricately branched from the base, pubescent ; flowers handsome, of a deep rosy purple colour. In bushy gravelly maritime places at the banks of the rivers Giraúl and Bero, usually flooded ; fl. and fr. July 1859. No. **1647**.

5. **S. antirrhinoides** Welw. ms. in Herb. ex H. Schinz (Aschers.) in Verh. Bot. Brandenb. xxx. p. 183 (1888).

Volkameria antirrhinodes O. Kuntze, *l.c.*, p. 482.

An erect, branched, annual herb, $\frac{1}{2}$ to 3 ft. high, rarely taller, hirsute with spreading hairs, viscid-glandular, sparingly branched ; stem and branches obtusely quadrangular, more or less leafy ; leaves opposite or subopposite, undivided, entire or remotely denticulate-repand, narrowly elliptical or sublanceolate, obtuse and apiculate or somewhat pointed at the apex, wedge-shaped at the base, membranous-herbaceous, 1 to 2 in. long by $\frac{1}{6}$ to $\frac{1}{2}$ in. broad; petioles ranging up to $\frac{3}{8}$ in. long; flowers axillary, solitary, about 1 in. long ; peduncle about $\frac{1}{5}$ in. long in flower, about $\frac{1}{5}$ or $\frac{1}{3}$ in. long and thickened especially upwards in fruit ; bracts 2, at the base of the peduncle and nearly equalling or rather exceeding it (one linear-filiform and the other spathulate), with a perforated globular apparently abortive flower-bud or large gland (nectary) between them ; calyx-segments narrowly lanceolate, $\frac{1}{5}$ to $\frac{1}{4}$ in. long ; corolla rosy violet or purple, minutely glandular and thinly pilose outside, campanulate-tubular, the tube about $\frac{1}{3}$ in. in diameter at the oblique throat, the limb about $\frac{1}{2}$ in. in diameter ; capsule oblong, roundedly tetragonal, somewhat compressed, 4-furrowed longitudinally, acuminate-beaked, hirsute, glandular, $\frac{3}{4}$ to 1 in. long (including the beak of $\frac{1}{4}$ in.), about $\frac{1}{4}$ in. broad, loculicidally 2-valved ; seeds numerous, obovate, compressed, $\frac{1}{10}$ in. long, black, with a rather broad uninterrupted projecting border or narrow wing round each face, foveolate-rugulose within the borders.

Mossamedes.—In bushy sandy places at the banks of the river

Bero, plentiful; fl. and fr. July 1859. No. **1643**. Same locality, fr. June 1859. Coll. Carp. 23.

This plant stains paper a reddish colour.

The following No. probably belongs to this species:—

Mossamedes.—Root dyeing red. In bushy places on a sandy clay soil, near Giraûl; without fl. or fr. July 1859. No. **1655**.

6. **S. pedalioides** Welw. ms. in Herb.

An erect, pubescent, branched, rather wiry herb, $\frac{1}{2}$ to 2 ft. high or more; branches alternate and opposite, spreading, ascending, obtusely tetragonal, leafy; leaves opposite subopposite or alternate, sublinear or narrowly spathulate, grey-green, puberulous, branny-glandular, entire or subrepand on the narrowly thickened-revolute margin, 1 to 2 in. long by $\frac{1}{16}$ to $\frac{1}{4}$ in. broad, spreading, obtusely pointed at the apex, wedge-shaped at the sessile or shortly petiolate base; flowers axillary, solitary but usually with a shortly stalked abortive flower-bud or large gland in the same axil and a pair of similar buds in the opposite axil, $\frac{1}{2}$ in. long; peduncles short, $\frac{1}{16}$ to $\frac{1}{8}$ in. long; calyx $\frac{1}{8}$ in. long, hirsute, deeply 5-lobed, the lobes narrowly lanceolate-linear, acute; corolla broadly campanulate-funnelshaped, somewhat ventricose at the base, thinly pilose outside, membranous, veiny, shortly lobed, the lobes rounded at the apex; stamens 4, subdidynamous; anthers oblong, included; ovary ovoid-oblong, hairy; style puberulous, $\frac{1}{8}$ to $\frac{1}{4}$ in. long, included; stigma bilobed; capsule hairy, ovoid-oblong, roundedly tetragonal, somewhat compressed especially upwards, very obtuse, subtruncate and slightly emarginate at the apex, $\frac{1}{3}$ in. long, with a furrow down each of the four sides, 4-cornuate at the base, bivalved, dehiscing from the apex; seeds in four longitudinal rows, blackish, obovate, flattened on the two faces, $\frac{1}{12}$ in. long, with a narrow wing or border surrounding each face except the narrow base, rugulose-ribbed within the borders more or less transversely or radiately.

Mossamedes.—In sandy sparingly herbaceous thickets on the left bank of the river Bero, here and there; fl. and fr. July 1859. No. **1643**, and Coll. Carp. 824.

7. **S. rigidum** Peyritsch in Sitz. Akad. Wien, xxxviii. p. 572 (1860).

Benguella.—In sandy maritime sparingly bushy places between Benguella and the river Catumbella; fl. and few fr. June 1859. No. **1646**.

8. **S. triphyllum** Welw. ex H. Schinz (Aschers.) in Verh. Bot. Brandenb. xxx. pp. 185, 239 (1888).

Volkameria triphylla O. Kuntze, *l.c.*, p. 482.

Mossamedes.—An erect, branched, annual herb, 3 to 4 ft. high: leaves digitate; leaflets 3 to 5, glaucous; flowers handsome, violet in colour outside, violet-purple inside; seeds angular, alveolate all over with small crowded pits, biauriculate on both faces above and below. In moist sandy places at the banks of the river Bero; fr. middle of July 1859. Probably this species. Coll. Carp. 28. Corolla violet purple. In gravelly places at the river Maiombo, near Pedra do Rei,

sparingly ; fl. and fr. June 1860. No. **1663**. At the latter station but sparingly, fl. Oct. 1859. No. **1663***b*.

Huilla.—An annual erect herb, 2 to 4 ft. high ; roots dyeing red ; leaves trifoliolate or very rarely quinquefoliolate, nearly glabrous, bright herbaceous-green on both faces ; flowers tolerably large, of a glaucous blood-red hue ; capsules nearly glabrous, longer than the petioles. In neglected fields between Nene and Humpata, and rather rare near Lopollo ; fl. Oct. 1859, fl. and fr. Dec. 1859 ; also in like places and in rather small thickets by the Monino ; fl. April 1860. No. **1662**.

9. **S. pentaphyllum** E. Mey. in Flora, 1843, ii. Beigabe, pp. 50, 54, 56, 222; & ex DC. Prodr. ix. p. 251 (1845).

Gongyla pentaphylla Bernh. ex DC., *l.c.* *Sesamopteris pentaphylla* DC., *l.c.* *Volkameria pentaphylla* O. Kuntze, *l.c.*, p. 482.

Benguella.—An erect, cæruleo-glaucescent, sparingly branched, apparently annual herb, 5 to 6 ft. high, very elegant ; corolla handsome, campanulate-subringent, violet-coloured outside, red-purple inside. In bushy sandy places near Benguella ; fl. and fr. end of June 1859. Coll. Carp. 25. A very beautiful plant ; leaves 5-foliolate, palmate, glaucous-silky ; leaflets petiolulate ; flowers violet-purple. In maritime gravelly places between Benguella and the river Cavado : fl. and fr. June 1859. No. **1661** partly.

Mossamedes.—An erect herb, 2 to 4 ft. high ; stem purple as well as the very delicately lepidote-glaucous leaves. In the dry bushy bed of the river Bero, very rare ; fl. and fr. June 1859. No. **1661** partly.

The plant stains paper a reddish colour.

5. **CERATOTHECA** Endl. ; Benth. & Hook. f. Gen. Pl. ii.p. 1059.

1. **C. integribracteata** Engl. Bot. Jahrb. xix. p. 156 (1894).

Zenza do Golungo.—An annual herb ; leaves pallid but not whitish-glaucous beneath ; flowers whitish rosy. At Muchâo, Mongôlo mountains, at the outskirts of forests of Leguminosæ ; fr. Sept. 1854. No. **1650**.

Golungo Alto.—In hilly places among low herbs near Sange, plentiful ; fl. and fr. Jan. and Feb. 1855. No. **1651**. An annual herb, 2 to $2\frac{1}{2}$ ft. high, resembling a species of *Digitalis* ; flowers rosy, tolerably large. In sunny places near Sange, not common ; fr. Jan. 1855. Coll. Carp. 822. Near Rodrigo's house ; fr. July 1857. Coll. Carp. 823.

Cazengo.—In secondary bushy woods near Cacula ; fl. and fr. June 1855. No. **1649**.

Ambaca.—An annual, erect, viscid, branched herb ; flowers like a foxglove in shape, from whitish to rosy, somewhat drooping. In a pasture among low bushes, between N-gombe and the river Lucala ; one specimen ; fl. Oct. 1856. No. **1652**.

Mossamedes.—A herb, $1\frac{1}{2}$ to 2 ft high, much branched from the base, more or less viscid throughout, certainly annual and not perennial ; flowers yellowish with a purplish tinge, black-punctate all over. In sandy places near Cavalheiros at the banks of the river Bero, usually flooded, not common ; fl. and fr. July 1859. No. **1654**.

Huilla.—Flowers rosy. In neglected fields near Lopollo ; fl. and fr. Nov. and Dec. 1859. No. **1653**.

This is probably the plant with the native name of "Quifocóso" in Golungo Alto, which when boiled Welwitsch's informant, Senhor Mariano, stated to have the virtue of killing lice.

6. **PRETREA** J. Gay; Benth. & Hook. f. Gen. Pl. ii. p. 1059.

1. **P. zanguebarica** J. Gay in Ann. Sc. Nat. ser. 1, i. p. 457 (1824). *Martynia zanguebaria* Lour. Fl. Cochinch. p. 386 (1790). *P. artemisiæfolia* Klotzsch in Peters, Mossamb. Bot. i. p. 188, t. 31 (1861).

Island of Zanzibar.—An infusion of the plant is mucilaginous and used as remedy in cases of gonorrhœa. Probably the "Biri-viri" of the Zanzibar people. Collected by Roquett in 1862 and sent to Welwitsch 10 Jan. 1863 by Dr. Hopffer; in fl. and fr. No. **1656**, and Coll. Carp. 825.

The three species of this genus which were mentioned by Klotzsch, *l.c.*, are probably all forms of the same species; see a letter on this subject by Welwitsch in the *Gazeta Medica de Lisboa*, p. 474 (1863).

7. **LINARIOPSIS** Welw. in Trans. Linn. Soc. xxvii. p. 53 (1869); Benth. & Hook. f. Gen. Pl. ii. p. 1060.

1. **L. prostrata** Welw., *l.c.*, p. 54; Ficalho, Pl. Uteis, p. 240 (1884).

Huilla.—A perennial herb; root thick, fleshy-fibrous, conical-cylindrical; stems several, prostrate, compressed, dilated at the nodes, sparingly branched; branches opposite, ascending, glandular and hirsute throughout with whitish hyaline sometimes laxer sometimes denser unequal hairs; leaves herbaceous-green, ciliate and with thinly scattered hyaline hairs above, branny-lepidote and whitish beneath; petioles with one or more glands; flowers axillary, purple-dusky, pruinose; calyx 5-partite to the base; the segments linear-lanceolate, rather obtuse, ciliate, one of them shorter than the rest; corolla tubular, the throat widened and gibbous, the limb bilabiate, the upper lobes straight, the middle lobe of the lower lip wider concave and boat-shaped, all the lobes rounded-obtuse; stamens 4, didynamous, included, ascending, inserted a little above the base of the corolla-tube where there is a ring of glandular hairs; anthers broadly obovate, cordate at the base, 2-celled; the cells separated by the connective, diverging, longitudinally dehiscing; ovary 2-celled; cells 1-ovulate; ovules erect or ascending; capsule woody (except the persistent calyx and disk), obovoid-cylindrical, short, obtuse, 4-ribbed, tuberculate in rows between the ribs, scarcely dehiscent, obtusely mucronate at the top with the remains of the style, incompletely 2-celled, the cells confluent above the middle, that is, the septum not reaching the centre, and thus 1-celled; endopleura thinly membranous, hyaline; seeds erect, obcordate, truncate at the base, compressed, towards the base with two short wings by the folding of the chestnut-brown membranous rather loose testa; embryo straight; cotyledons obovate, obtuse and somewhat emarginate at the apex, rather fleshy, flattened; radicle inferior, broadly conical, obtuse, rather short. In hilly places in short grass by streams between Mumpulla and Nene, at an elevation of from 4500 to 5000 ft.; also near Lopollo, but there not very plentiful; fl. and fr. Oct. 1859. No. **1659**.

XCIV. ACANTHACEÆ.

1. **THUNBERGIA** L. f.; Benth. & Hook. f. Gen. Pl. ii. p. 1072.

1. **T. affinis** S. Moore in Journ. Bot. 1880, pp. 5 (Jan.), 194, 196 (July); Burkill in Fl. Trop. Afr. v. p. 11 (1899).

Golungo Alto.—A shrub, climbing high and wide, remarkably

ornamental; flowers handsome, deep blue, like those of *Gloxinia* in size and shape; calyx deeply 10-cleft. In shady forests, near Calólo in Sept. and at the Capopa spring 1 Dec. 1854; fl. and unripe fr. No. **5181**. At Casaballa; fl. and fr. July 1855. No. **5154**. Flower 2 in. long; bracteoles $\frac{5}{6}$ in. long; peduncles whitish, $\frac{7}{8}$ in. long. No. **5113**. No notes. No. **5088**, as to the flowering pieces (the leafy shoot of this No. bears tendrils and belongs to a different Order). By oil-palms near the banks of the river Cuango; fr. Dec. 1855. Coll. Carp. 835. A lovely, evergreen shrub, climbing high and far; trunk hard, woody, scarcely as thick as a man's finger; branches sarmentose, purplish, somewhat twining; leaves softly coriaceous, quite glabrous, ovate-lanceolate, gradually narrowed at the apex into a long acumen, repand-undulate on the margin, deep green and but little shining above, pale green and elevately-ribbed beneath; petioles $\frac{1}{8}$ to $\frac{1}{6}$ in. long, semi-cylindrical, more or less curved, articulate at the base; flowers solitary in the axils of the leaves, azure-blue, handsome, with the aspect of a *Gloxinia*; peduncles 1 to $1\frac{1}{2}$ in. long; calyx deeply 12- or 13-cleft, bibracteolate at the base; bracteoles thinly membranous, pale greenish, obliquely ovate, acuminate, nearly glabrous, 5-nerved, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, quasi-spathelike in consequence of the sides more or less cohering; calyx-lobes lanceolate-linear, not subulate, erect, loosely embracing the corolla-tube, green, densely beset with stalked glands, the alternate lobes shorter; corolla funnel-shaped, almost bilabiate after the fashion of Bignoniaceæ or *Gloxinia*; the tube an inch long, transversely compressed, constricted above the ovary, gradually and obconically dilated above, obtusely keeled on the upper side, rather acutely keeled on the lower side, whitish violet on the exterior, deep yellow within; the limb 5-cleft, patent, deep blue both inside and out; the lobes obovate-subrotund, imbricate and contorted at the base; stamens 4, adnate to the corolla-tube a little above its constriction, didynamous, included; filaments flatly compressed, 2-edged, yellowish at the base; anthers bilocular, white; the cells somewhat diverging and not aristate at the base, ciliate-bearded, one cell much shorter than the other, the beard white, the connective produced beyond the cells into a subulate acumen; ovary semi-ellipsoidal; style simple, a little exceeding the stamens, incumbent in the lower side of the corolla-tube, whitish; stigma bilabiate, whitish; the lower lip funnel-shaped, the outline of its mouth obcordate; the upper lip triangular, transversely placed with reference to the lower lip; disk hypogynous, fleshy, forming a ring round the base of the ovary. In dense very shady forests close to the banks of the river Cuango, at Capopa, near Sange; fl. and young fr. 19 June 1856. Probably this species or its variety *pulvinata*, S. Moore, *l.c.*, p. 6; Burchill, *l.c.*, p. 12. No. **5145**. The species occurred also near N-delle, 19 Nov. 1855.

Pungo Andongo.—A shrub climbing to a great height and then hanging down; bracteoles petaloid, apparently white; corolla deep blue, the tube yellow inside. At the banks of the river Lombe, sparingly; fl. and fr. end of March 1857. No. **5109**.

The Lichen n. 274 at Sange in Feb. 1855 grew on the leaves of perhaps this species of *Thunbergia*.

2. **T. huillensis** S. Moore, *l.c.*, p. 194; Burkill, *l.c.*, p. 15.

Huilla.—Flowers pale blue; capsule compressedly ovoid-conical, bivalved, $\frac{3}{4}$ in. long, just exceeding the bracteoles. In the more elevated pastures of Morro de Monino among low bushes; fl. and fr. Jan. and Feb. 1860. No. **5025**.

The minute structure of this, as well as of the next species, shows medullary xylem-islands and a woody cylinder which after a time is broken up just as occurs in the genus *Mendoncia*. See Journ. Bot. xxxii. p. 219 (1894).

3. **T. alata** Bojer ex Sims, Bot. Mag. t. 2591 (1825); Hook Exot. Fl. t. 177 (1827); Burkill, *l.c.*, p. 16.

Sierra Leone.—A climbing herb; leaves 1½ in. long; petiole as long, often winged; corolla sulphur-orange in colour, blackish purple at the bottom; capsule, including the beak, nearly an inch long. By fences and in bushy places near Freetown, not common; fl. and fr. Sept. 1853. No. **5207**.

4. **T. Cycnium** S. Moore, *l.c.*, p. 194; Burkill, *l.c.*, p. 17.

Huilla.—Flowers white. In bushy rocky places, flooded in the rainy season, near Lopollo; fl. and unripe fr. Dec. 1859. No. **5009**.

The part of Mr. Moore's description, *l.c.*, which relates to the climbing and pendulous habit, is not applicable to this plant, and was probably intended to belong to the description of *T. affinis*.

5. **T. armipotens** S. Moore, *l.c.*, p. 195; Burkill, *l.c.*, p. 20.

Huilla.—In the Empalanca bushy pastures; fl. and fr. Dec. 1859. No. **5026**. Leaves hastate, rough; flowers blue. At Lopollo; fl. and fr. April 1860. No. **5027**.

6. **T. sessilis** Lindau in Engl. Bot. Jahrb. xvii. p. 96 (9 May 1893); Burkill, *l.c.*, p. 21.

Huilla.—Fruit compressed, lanceolate, glabrous, firmly coriaceous, chestnut in colour, dehiscing laterally at the apex. In wooded pastures flooded in summer, near Humpata; only one specimen; fr. April 1860. No. **5044**.

7. **T. lamellata** Hiern, sp. n.

T. (Eu-Thunbergia) sp. nov., S. Moore, *l.c.*, p. 196.

A nearly glabrous, erect herb, with the habit of a *Petunia*, 1 to 1½ ft. high, much branched from the base; rootstock thick, perennial; stems numerous, rather wiry, obtusely quadrangular, furrowed; branches opposite and alternate, ascending or strictly erect, puberulous at the nodes; leaves opposite, obovate-oblong, linear-oblong or elongate-lanceolate, obtuse or emarginate or subapiculate at the apex, a little narrowed to the sessile base, puberulous or subscabrid, rather fleshy, rigid, glaucous-green, more or less erect, pauci-veined, entire on the narrowly revolute margin, 1⅓ to 3½ in. long by ⅛ to ⅜ in. broad; flowers large, white; fruiting peduncles solitary in the upper axils, ⅛ to ¼ inch long, rather thick; bracteoles lanceolate-oblong, 5- to 7-nerved, rather obtusely pointed at the apex, puberulous, 1 to 1½ in. long; fruiting calyx ¼ to ⅜ in. long; the segments 12 to 15, rigid, subulate; capsule ⅞ to 1 in. long, the lower part subglobose, ⅜ to ½ in. diameter, the upper part (or beak) oblong, ⅛ to ¼ in. broad; seeds ¼ to ⅓ in. long, covered with imbricate adpressed lamellæ.

Huilla.—In hilly rocky places among tall bushes between the lake of Ivantâla and Quilengues; fr. end of Feb. 1860. No. **5062**. In thickets near Lopollo and at the Hippopotamus lake (Ivantâla); fr.

Jan. and March 1860. Coll. Carp. 31. In mountainous wooded rather dry places at the lake of Ivantâla; fr. 29 Feb. 1860. Coll. Carp. 827.

8. **T. angolensis** S. Moore, *l.c.*, p. 195; Burkill, *l.c.*, p. 24.

Huilla.—A very beautiful plant, clothed on all parts with a white tomentum; flowers pale azure-blue. In thickets between Mumpulla and Humpata, in company with species of *Gnidia* (cf. *G. Rendlei*; Welw. herb. no. 6478) and *Thesium* (cf. *T. Welwitschii*, Welw. herb. no. 6435); fl. Oct. 1859. No. **5037**. In wooded thickets between Mumpulla and Nene; fl. end of Oct. 1859. No. **5038**.

9. **T. lancifolia** T. And. in Journ. Linn. Soc. vii. p. 19 (1863); Burkill, *l.c.*, p. 25.

Var. *α.* **auriculata** S. Moore, *l.c.*, p. 195.

Huilla.—An erect, branched, perennial, rather rigid herb; stems several, 1½ to 2 ft. high; leaves coriaceous, deep green; calyx shortly cupuliform, irregularly denticulate, bibracteolate; corolla handsome, campanulate-infundibuliform, ½–1 in. long, deep blue; the tube orange in colour, thickened; the throat inflated; the limb sub-bilabiate, 5-cleft, spreading; the lobes obtuse; stamens 4, but little didynamous; anthers 2-celled; the equal cells obtuse and densely bearded at the base, connately mucronate at the apex; filaments dilated at the apex; stigma funnel-shaped, dilated at the apex with a triangular margin; seeds hemispherical. Mostly in bushy sandy places about Lopollo, sparingly; fl. and fr. Dec. 1859 to April 1860. No. **5011** and Coll. Carp. 828.

Var. *β.* **lævis** S. Moore, *l.c.*

Golungo Alto.—An erect, branched, glaucous-green, perennial herb, 3 to 4 ft. high; rhizome thickly woody; stems numerous; leaves thinly coriaceous, somewhat fleshy, becoming rigid; flowers very handsome; corolla-tube yellow outside and more intensely so inside: the limb deep blue; fruits 1¼ to 1½ in. long. On the elevated rather dry slopes of Sobato Quilombo-Quiacatubia, at Comahóge; fr. and a few fl. middle of July 1856. No. **5110**.

Ambaca.—A branched, somewhat erect herb, 2 to 3 ft. high, with very handsome deep blue flowers resembling a *Gloxinia*. On bushy muddy declivities to the east of Izanga, plentiful; fl. Oct. 1856. No. **5161**.

Var. *γ.* **pallida** S. Moore, *l.c.*

Huilla.—In the wooded thickets of the Monino, rather rare; fl. and fr. Dec. 1859 and Jan. and Feb. 1860. No. **5012**. A perennial herb, 1 to 2 ft. high; stems numerous; flowers handsome, blue; fruit 1 in. long. In thickets near Lopollo, rare; fr. Jan. 1860. Coll. Carp. 826.

10. **T. hyalina** S. Moore, *l.c.*, p. 195; Burkill, *l.c.*, p. 26.

Pungo Andongo.—A perennial herb; root tubercular-woody; stems numerous, 1 to 2½ ft. high; flowers coppery purple, orange-coloured inside and on the tube outside; unripe capsule about an inch long. In rocky hilly places at the river Cuanza, near Sansamanda; fl. and young fr. 30 April 1857. No. **5164**.

The following No. is incomplete and insufficient for specific determination; see S. Moore, *l.c.*, p. 196:—

Pungo Andongo.—Fruit solitary, shortly pedunculate: calyx-

segments 10, narrowly lanceolate, $\frac{1}{2}$ to $\frac{1}{6}$ in. long, glabrous; seeds solitary, $\frac{1}{6}$ in. in diameter, umbilicate, with short adpressed papillæ. Between the præsidium and Caghuy, in company with other Acanthaceæ; fr. Feb. 1857. No. **5218**.

2. **TUBIFLORA** Gmelin, Syst. Nat. 2, i. pp. 19, 27 (1791).

Elytraria Mich. Fl. Bor. Amer. i. p. 8 (1803); Vahl, Enum. i. p. 106 (1804); Benth. & Hook. f. Gen. Pl. ii. p. 1073.

1. **T. caroliniensis** Gmelin, *l.c.*

Justicia acaulis L. f. Suppl. Pl. p. 84 (1781). *Anonymos caroliniensis* Walter, Fl. Carol. p. 60 (1788). *Elytraria Vahliana* Mich., *l.c.*, i. p. 9, t. 1. *E. crenata* Vahl, *l.c.*; S. Moore in Journ. Bot. 1880, p. 196; Burkill in Flor. Trop. Afr. v. p. 27 (1899). *E. lyrata* and *E. virgata* Vahl, *l.c.* *E. caroliniensis* and *E. indica* Pers. Syn. Pl. i. p. 23 (1805). *E. marginata* Vahl ex P. Beauv. Fl. Owar. ii. p. 58, t. 93, fig. 2 (1818) *T. acaulis* O. Kuntze, Rev. Gen. Pl. ii. p. 500 (1891).

Golungo Alto.—Habit of *Plantago*. Cungulungulo; fl. Feb. 1855. No. **5209**. A low herb; leaves membranous, bright green; flowers white; calyx bibracteolate at the base, 4-cleft nearly to the base, the top segment the broadest, the lateral ones narrow, the bottom one deeply bifid; ovary narrowly oblong, a little compressed; style filiform-subulate, stigmatose at the apex. In moist wooded, half-shady places among the Queta mountains at the banks of the river Coango, rather rare; late fl. beginning of May 1856. No. **5157**. Quibôlo; fl. May 1856. No. **5210**. A stemless herb, with the aspect of *Plantago major* L., perennial or biennial; rhizome horizontal, rather thick; leaves obovate-spathulate, on the margin almost entire or sometimes runcinate towards the base, dull green, membranous, much attenuate into the petiole; flowers whitish. In the more elevated forests of Sobato Cabanga-Cacalungo, among the Cungulungulo mountains; fl. and few fr. middle of June 1856. No. **5156**.

3. **NELSONIA** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 1073.

1. **N. campestris** R. Br. Prodr. p. 481 (1810); Burkill in Fl. Trop. Afr. v. p. 28 (1899).

Justicia brunelloides Lam. Tabl. Encycl. i. p. 40 (1791). *J. canescens* Lam., *l.c.*, p. 41. *J. origanoides*, *J. hirsuta*, & *J. nummulariæfolia* Vahl, Enum. i. p. 122 (1804). *J. tomentosa* and *J. lamifolia* Roxb. Hort. Beng. p. 4 (1814); Wall. List, n. 2370 (1830). *N. rotundifolia* R. Br., *l.c.* *N. hirsuta* Roem. & Schult. Syst. Veg. i. p. 172 (1817). *N. nummulariæfolia* & *N. origanoides* Roem. & Schult., *l.c.*, p. 173. *N. albicans* H. B. & K. Nov. Gen. ii. p. 234 (1817). *N. lamiifolia* R. Br. ex Spreng. Syst. Veg. i. p. 42 (1825). *N. canescens* Spr., *l.c.* *N. tomentosa* A. Dietr. Sp. Pl. i. p. 419 (1831); S. Moore in Journ. Bot. 1880, p. 196. *N. brunellodes* O. Kuntze, Rev. Gen. Pl. ii. p. 493 (1891).

Golungo Alto.—A quite prostrate herb, only the spikes of pale blue flowers erect. In the arimo of Senhor Mariano on the right bank of the river Cuango, sparingly in plots formerly cultivated; fl. and fr. Dec. 1854. No. **5217**. Habit of *Prunella*: spikes very dense, whitish shaggy, soft and limp in the living state; flowers small,

caducous. In damp shady parts of palm groves on the left bank of the river Cuango, rather rare ; fl. and fr. July 1855. No. **5216**. A low prostrate herb ; branches often rooting at the nodes, the flowering branches suberect ; leaves membranous, sordid-green above, paler beneath ; flowers densely clustered in terminal heads, very abundant ; calyx 4-partite down to the base, two of the segments broader than the rest, one of the two bifid at the apex ; corolla violet-blue, bilabiate, the upper lip 2-lobed, the lower lip 3-lobed, all the lobes emarginate or toothed at the apex ; the upper lip a little shorter than the lower, saccate-gibbous behind at the base ; corolla-tube rather compressed, whitish, but little curved, pilose only at the throat about the insertion of the two very short stamens ; anthers white, semilunar, attached at the hollow, touching each other on the sides ; pollen white ; ovary sessile, ovoid-oblong ; style filiform, smooth ; stigma somewhat bilobed ; capsule ovoid-conical, woody-beaked at the apex. In shady places at the stream Cuango ; few fl. April 1856, and afterwards cultivated in Welwitsch's Golungo garden. No. **5212**. At the bank of the river Cuango ; fl. June 1856. No. **5213**. In marshy woody places at Catomba by the Luinha ; fl. and fr. July 1856. No. **5214**. At the river Cuango, near Quibólo ; fl. and fr. July 1856. No. **5215**.

4. **HIERNIA** S. Moore in Journ. Bot. (1880) p. 196, t. 211 ; Lindau in Engl. Nat. Pflanzenfam. iv. 3*b*., p. 288 ; Burkill & C. B. Cl. in Fl. Trop. Afr. v. p. 5 (1899).

There seems to me to be no sufficient reason to doubt the correctness of the position, as assigned by the author of the genus, namely, in the tribe Nelsonieæ.

1. **H. angolensis** S. Moore, *l.c.*, p. 197.

Bumbo.—A rigid, viscid shrublet, much branched in a broomlike manner ; flowers blue. In open forests composed of *Copaiba Mopane* O. Kuntze (Welw. herb. no. 605), near Quitibe de Cima, very plentiful ; fl. and fr. June 1860. No. **5001**.

5. **HYGROPHILA** R. Br. ; Benth. & Hook. f. Gen. Pl. ii. p. 1075.

Nomaphila Blume ; Benth. & Hook. f., *l.c.*

1. **H. uliginosa** S. Moore in Journ. Bot. (1880) p. 197 ; Burkill in Fl. Trop. Afr. v. p. 32 (1899).

Pungo Andongo.—Flowers violet-purple. In swampy places at the river Lombe and near Bumba ; fl. and fr. March 1857. No. **5106**.

2. **H. linearis** Burkill, *l.c.*, p. 35.

Huilla.—A herb with the habit almost of a *Gratiola*, apparently annual ; stems slender, tetragonal, here and there rooting at the nodes, ascending ; leaves opposite, narrowly linear-lanceolate or sublinear, spreading ; calyx deeply 5-cleft ; the lobes linear, acuminate ; corolla violet in colour, puberulous outside, bilabiate, the upper lip emarginate, the lower 3-lobed ; stamens 4, inserted on the posterior lip, included, two of them sterile, with their filaments capitellate at the apex and shorter than those of the fertile ones ; anthers of the fertile stamens cordate-ovoid, attached at the sinus, 2-celled, the cells at length so arched that the anthers become almost horseshoe-shaped ; ovary elongated, 2-celled ; style long, filiform ; stigma bilobed, the lobes more or less cylindrical, and one of them not rarely obsolete or much shorter than the other ; capsule elongate-cylindrical, subcompressed, 2-celled,

bivalved, the cells several-seeded ; seeds erect-spreading, placed in two rows at the placenta in each cell, rather large in proportion to the size of the plant. By the wet sides of streams between Nene and Ohai, rather rare ; fl. and fr. middle of May 1860. No. **5772**.

6. **BRILLANTAISIA** Pal. Beauv. ; Benth. & Hook. f. Gen. Pl. ii. p. 1076.

1. **B. Lamium** Benth. in Hook. Niger Fl. p. 477 (1849) ; Burkill in Fl. Trop. Afr. v. p. 38 (1899).

Leucorhaphis Lamium Nees in DC. Prodr. xi. p. 97 (1847).

Prince's Island.—Herbaceous, 1 to 2 ft. high ; stems erect or ascending ; flowers deep blue. In moist exposed woody situations, almost everywhere ; fl. and fr. Sept. 1853. No. **5205**.

2. **B. patula** T. And. in Journ. Linn. Soc. vii. p. 21 (1863) ; Burkill, *l.c.*, p. 41.

B. alata T. And. ex Oliv. in Trans. Linn. Soc. xxix. p. 125, t. 124 (1875).

Var. **Welwitschii** Burkill, *l.c.*, p. 42.

B. alata S. Moore in Journ. Bot. 1880, p. 197.

Golungo Alto.—A gigantic herb, 5 ft. high and more ; stem straight, acutely angular, branched in the upper part ; flowers deep blue, resembling those of a *Salvia*. By the streams Cuango and Quibôlo, plentiful ; fl. July, fr. Aug. and Sept. 1856. No. **5182**. A herb of 5 to 7 ft., with handsome azure-blue flowers. By the Quiapoze and Cuango streams, near Sange, not abundant ; in fl. No. **5149**. No notes. In fl. and fr. No. **5150**.

Cazengo.—Flowers thyrsoid, blue. Muxaulo : fr. June 1855. Coll. Carp. 834.

7. **DYSCHORISTE** Nees in Wall. Pl. As. Rar. iii. p. 75 (1832).

Calophanes D. Don in Sweet, Brit. Fl. Gard., ser. 2, ii. n. 181 (March 1833) ; Benth. & Hook. f. Gen. Pl. ii. p. 1077.

1. **D. radicans** Nees in DC. Prodr. xi. p. 106 (1847) ; C. B. Cl. in Fl. Trop. Afr. v. p. 73 (1899).

Ruellia radicans Hochst. in Pl. Schimp. Abyss. i. nn. 17, 177 ; non Lindau. *Calophanes radicans* T. And. in Journ. Linn. Soc. vii. p. 23 (1863) ; S. Moore in Journ. Bot. (1880) p. 197, partly.

Pungo Andongo.—A shrublet, 1 to 2 ft. high ; the numerous stems and branches ascending-erect and almost forming thick clumps : flowers pale sulphur in colour, subaromatic, much frequented by bees ; calyx equally 5-cleft ; corolla bilabiate, the lower lip 3-lobed, the lobes shortly incised at the somewhat obtuse apex, the middle lobe sprinkled with black-purple dots, the upper lip more deeply bilobed, its lobes somewhat obtuse, the tube straight and cylindrical ; stamens 4, all fertile, exserted ; filaments inserted a little below the throat of the corolla ; ovary elongate-ovoid, almost cylindrical, subsessile, inserted on the thick orange-coloured disk at the bottom of the calyx, 2-celled : ovules few, perhaps 3 or 4 in each cell ; nearly ripe seeds compressedly ovoid, emarginate at the base, cordiform ; style filiform, bifid at the apex. On the bushy slopes of the gigantic rocks of the præsidium,

looking south, above Calunda; fl. and young fr. 14 Dec. 1856. No. **5075**. No notes; in fl. No. **5158**. In fr. No. **5189**.

Huilla.—A prostrate herb, apparently perennial; stem angular; leaves wavy, reddish on the nerves and margin; flowers whitish, ringent; stamens 4, didynamous. In herbaceous places near Lopollo; fl. and fr. 12 Feb. 1860. No. **5046**.

2. **D. mutica** C. B. Cl., *l.c.*, p. 73.

Calophanes radicans, var. *mutica* S. Moore, *l.c.*, p. 198.

Pungo Andongo.—Half a foot high. In fr. No. **5089**. In fl. and fr. No. **5094**. A herblet, 5 to 8 in. high; flowers whitish. In hilly rather dry places near Condo, very rare; fl. March 1857. Only two specimens found, doubtfully referred to this species. No. **5083**. Plant 7 in. high; leaves ranging up to $1\frac{3}{4}$ in. long. Doubtful. No. **5082**. Plant 7 in. high. In fl. Doubtful. No. **5166**.

3. **D. tubicalyx** C. B. Cl., *l.c.*, p. 74.

Calophanes radicans S. Moore, *l.c.*, p. 197, *partly*.

Huilla.—Flowers whitish. In the drier elevated thickets of Empalanca; fl. April 1860. No. **5055**.

4. **D. nobilior** C. B. Cl., *l.c.*

Pungo Andongo.—In wooded shady rocky places between Candumba and Calundo, in company with a Bambusacea (cf. *Oxytenanthera abyssinica* Munro; cf. Welw. herb. no. 1134); fr. March 1857. No. **5107**.

Mr. Clarke quotes No. 5158 also for this species, but its habit seems to agree better with *D. radicans* to which I have referred it.

8. **RUELLIA** Plum., L.; Benth. & Hook. f. Gen. Pl. ii. p. 1077.

1. **R. patula** Jacq. Misc. ii. p. 358 (1781); C. B. Clarke in Fl. Trop. Afr. v. p. 45.

Loanda.—An undershrub, 1 to $1\frac{1}{2}$ ft. high, branched from the base; branches becoming woody at the base; flowers violet-blue, $\frac{5}{6}$ in. long; corolla-limb 5 cleft, with obtuse lobes; stamens 4, didynamous, inserted below the corolla-throat where the tube begins to widen, included; anthers oblong, white, dorsifixed, 2-celled, the cells somewhat diverging at the base; style filiform; stigma after the flowering dilated. In hilly sandy places near Maianga do Povo; fl. and fr. Jan. 1858. No. **5127**. A plant of 2 ft., sometimes biennial, sometimes lasting for several years; flowers white. In dry bushy stony places near Teba and Boa Vista, rare; fl. and fr. beginning of June 1858. No. **5186**. A decumbent herb, with ascending branches, $\frac{1}{2}$ to 1 ft. high, apparently annual; two specimens in fr. No. **5139**. No notes; in fr. Nos. **5069**, **5121**. A shrublet, almost an undershrub, 1 to 2 ft. high; flowers from purplish to bluish. In hilly bushy places near Boa Vista; fr. Dec. 1857 and Jan. 1858. Coll. Carp. 831.

2. **R. prostrata** Poir. in Lam. Encycl. Méth. vi. p. 349 (1804); C. B. Cl., *l.c.*, p. 46.

Loanda.—No notes. In fr. No. **5063**, *partly*.

Mr. Clarke, *l.c.*, thinks that this is not the plant so named in the Encyclopédie, because the calyx is there described as short; he refers that plant to *R. patula* Jacq., and calls this one *R. prostrata* T. And. in Journ. Linn. Soc. vii. p. 24 (1863). A synonym is *R. Wightiana* Wall. List n. 2397 (1830), and ex Nees in DC. Prodr. xi. p. 124 (1847).

3. **R. bignoniæflora** S. Moore in Journ. Bot. 1880, p. 198; C. B. Cl., *l.c.*, p. 48.

Dischistocalyx bignoniiflorus Lindau in Engl. Nat. Pflanzenfam. iv. 3*b*., p. 307 (1895).

Ambriz.—In thickets near Banza do Regulo Quisembo, sparingly; with the corollas fallen. end of Nov. 1853. No. **5126**.

Loanda.—A glandular-viscid undershrub, 2 to 3 ft. high, with white flowers. In rocky places at Praia de Zamba Grande, plentiful; fl. and fr. 16 Jan. 1859. No. **5202**. No notes. In fr. No. **5063**, *partly*. Corolla nearly 4 in. long, with an elongated trumpet-shaped tube. No. **5130**. Suffruticose, the whole plant emitting a goatish smell; stem beset with whitish hairs; flowers large, white. In thickets near Boa Vista; fr. March 1854. Probably this species. Coll. Carp. 829.

The following description taken from Welwitsch's MSS. probably belongs to *Ruellia bignoniæflora* S. Moore:—

Loanda.—An erect, branched undershrub or shrublet, remarkable for its goatish smell; stems whitish, woody: branches herbaceous, as well as the leaves beset with stalked densely crowded viscid rank-fetid glands; flowers white, solitary in the axils of the leaves, erect-spreading, quickly withering; calyx deeply 5-cleft, divided to the base; the segments equal, elongated, linear-lanceolate, erect, beset on the back with glandular hairs, ciliate on the margin with longer glandless hairs; corolla tubular, somewhat funnel-shaped; the tube long, shortly pilose outside, glabrous within, cylindrical nearly throughout its whole length, the limb subequally 5-cleft. the lobes during the flowering subbilabiately spreading; stamens 4, didynamous, inserted a little below the corolla-throat, included; filaments cylindrical, somewhat pilose; anthers linear-oblong, whitish, bifid at the base, attached at the back near the emargination, bilocular; the cells parallel, muticous; ovary ovoid-conical, sessile in the centre of the thick white turgid disk, bilocular; the cells 4-ovulate; the ovules ascending, reniform; style long, a little exceeding the stamens, filiform; stigma bifid; the lobes unequal in length, stigmatose on the inner side. In dry plantations of *Euphorbia*, also in hilly bushy places near Boa Vista, plentiful; fl. from November to March. Distinguished from all other Angolan Acanthaceæ by its long tubular flowers, coupled with its rank goatish smell.

4. **R. diversifolia** S. Moore, *l.c.*, p. 198; C. B. Cl., *l.c.*, p. 48.

Mossamedes.—A suffrutescent herb, 2 to 3 ft. high, clothed with white goatish-fetid glands and hairs; stems numerous; flowers white. On rocks of red sandstone at Boca do Rio Bero, only in a few places; fl. and fr. July 1859. No. **5042**.

Bumbo.—Corolla whitish with a flesh-coloured tube. At the outskirts of thickets and in dense thickets near Bumbo: fl. and fr. Oct. 1859. No. **5033**.

As to whether this species should be referred to the genus *Paulowilhelmia*, see Lindau in Engl. Nat. Pflanzenfam. iv. 3*b* p. 301 (1895). The pollen is globose, nodulose, not prickly.

9. **PETALIDIUM** Nees; Benth. & Hook. f. Gen. Pl. ii. p. 1081.

1. **P. physaloides** S. Moore in Journ. Bot. 1880, pp. 225, 228, tab. 212, fig. 2; C. B. Cl. in Fl. Trop. Afr. v. p. 89.

Pseudobarleria physaloides Lindau in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 299 (1895).

Mossamedes.—Corolla orange-scarlet. In the thickets of the elevated mountains between Pomangala and Quitibe, plentiful ; fl. and fr. June 1860. No. **5000**.

2. **P. Welwitschii** S. Moore, *l.c.*, pp. 227, 228, tab. 212, fig. 1 ; C. B. Cl., *l.c.*, p. 89.

Pseudobarleria Welwitschii Lindau, *l.c.*, p. 300.

Mossamedes.—Flowers blue. On rocky heights on the left bank of the river Maiombo near Páo, tolerably abundant ; fl. and fr. Oct. 1859 and June 1860. No. **5041**.

3. **P. halimoides** S. Moore, *l.c.*, p. 228 ; C. B. Cl., *l.c.*, p. 90.

Barleria halimoides Nees in DC. Prodr. xi. p. 231 (1847). *P. loranthifolium* S. Moore, *l.c.*, p. 227. *Pseudobarleria halimoides* and *Ps. loranthifolium* Lindau, *l.c.*, p. 300.

Mossamedes.—A prostrate, perennial undershrub ; stems numerous, hard, rigid ; leaves somewhat fleshy, in shape like those of *Lysimachia nummularia* L. ; flowers carmine. On the rocky plateau between S. João de Caroca and Cazimba ; fl. and fr. 3 Sept. 1859. No. **4997**.

4. **P. glandulosum** S. Moore, *l.c.*, pp. 226, 228 ; C. B. Cl., *l.c.*, p. 91.

Pseudobarleria glandulosa Lindau, *l.c.*, p. 299.

Benguella.—A shrublet, after the fashion of a *Mimulus*. In sandy thickets near Benguella ; fl. June 1859. This plant was the host of *Loranthus Buchneri* Engl. (Welw. herb. n. 4854, which is a larger and stronger plant than its host). No. **5047**.

5. **P. spiniferum** C. B. Cl., *l.c.*, p. 91.

P. sp. n., S. Moore, *l.c.*, p. 228.

Var. **obtusa** C. B. Cl., *l.c.*

Mossamedes.—Flowers from whitish to violet in colour. In shrubby places near Pomangala, not common ; fl. June 1860. No. **4998**.

See S. Moore, *l.c.*

6. **P. rupestre** S. Moore, *l.c.*, pp. 226, 228 ; C. B. Cl., *l.c.*, p. 92.

Pseudobarleria rupestre Lindau, *l.c.*, p. 300.

Mossamedes.—A very densely branched shrublet, 2 to 3 ft. high, very viscid on all parts : flowers whitish-rosy or white with purple lines. By red sandstone rocks near Boca do Rio Bero, not uncommon ; fl. and fr. July 1859. No. **5022**.

7. **P. Lepidagathis** S. Moore, *l.c.*, pp. 227, 228 ; C. B. Cl., *l.c.*, p. 93.

Pseudobarleria Lepidagathis Lindau, *l.c.*, p. 300.

Mossamedes.—A perennial herb, a foot and a half high, much branched from the base ; root woody ; stems and branches prostrate-ascending, leafy towards the apex ; leaves opposite ; flower-clusters strobiliform ; corolla carmine or dusky red, lasting a long time. At the red sandstone rocks near Boca do Rio Bero, very plentiful ; fl. and fr. July 1859. No. **5007**. Serra de Montes negros ; fl. 10 Aug. 1859. No. **5020**.

8. **P. coccineum** S. Moore, *l.c.*, pp. 225, 228 ; C. B. Cl., *l.c.*, p. 93.

Pseudobarleria coccinea Lindau, *l.c.*, p. 299.

Mossamedes.—A branched, decumbent-ascending shrublet ; leaves

deep green, somewhat viscid ; flowers scarlet. In rough mountainous places on a mica-schist formation, at the river Maiombo, near Pomangala ; fl. Oct. 1859. No. **5017**. In shrubby places in the same neighbourhood ; fl. June 1860. No. **5018**.

10. **MICRANTHUS** Wendl. Bot. Beob. p. 38 (1798) ; non Pers. (1805) (sect. *Gladioli*).

Phaylopsis Willd. Sp. Pl. iii. p. 342 (1801) ; Benth. & Hook. f. Gen. Pl. ii. p. 1081. *Phaulopsis* Spreng. Anl. ii. 1, p. 422 (1817).

1. **M. angolanus** O. Kuntze, Rev. Gen. Pl. ii. p. 493 (1891).

Phaylopsis angolana S. Moore in Journ. Bot. 1800, p. 229 ; C. B. Cl. in Fl. Trop. Afr. v. p. 84.

Golungo Alto.—A herb ; stem rooting at the lower nodes, flexuous ; flowers white. In bushy places among the mountains of the eastern Queta at Catomba ; fl. beginning of July 1856. No. **5175**.

The following No. must be compared with *M. angolanus* :—

Zenza do Golungo.—A herb, annual, straight, viscid. In dry hilly bushy places near Calumguembo ; fr. without leaves Sept. 1854. No. **5146**.

2. **M. obliquus** O. Kuntze, *l.c.*

Phaylopsis obliqua T. And. ex S. Moore, *l.c.* ; C. B. Cl., *l.c.*, p. 86. *Phaulopsis obliquus* Lindau in Engl. Nat. Pflanzenfam., Nachtrag, p. 305 (1897).

Golungo Alto.—An annual herb ; stem ascending ; branches twisted ; flowers white. In secondary thickets at the outskirts of the forest near the river Delamboa ; fr. and few fl. June and July 1856. No. **5115**.

11. **WHITFIELDIA** Hook. ; Benth. & Hook. f. Gen. Pl. ii. p. 1085.

1. **W. longifolia** T. And. in Journ. Linn. Soc. vii. p. 27 (1863), *partly* ; S. Moore in Journ. Bot. 1800, p. 229 (*longiflora*), *partly* ; C. B. Cl. in Fl. Trop. Afr. v. p. 66.

Cazengo.—In the primitive forests of Muxaulo ; fl. June 1855. No. **5152**.

Pungo Andongo.—Branches patent. Fl. No. **5086**. No notes. Fl. No. **5193**. Branched, apparently several feet high ; flowering spikes erect or scarcely so ; fl.-bud. No. **5077**.

2. **W. subviridis** C. B. Cl., *l.c.*, p. 66.

W. longiflora S. Moore, *l.c.*, *partly*.

Golungo Alto.—A shrub as tall as a man : flowers and calyx brilliantly white, very handsome. In elevated shady places at the cataracts of the Capopa stream, in Sobato de Bumba, not common ; fl. end of August 1855. No. **5151**. No notes. Fl.-bud. Probably this species. No. **5153**.

12. **BLEPHARIS** Juss. ; Benth. & Hook. f. Gen. Pl. ii. p. 1089.

1. **B. boerhaviæfolia** Pers. Syn. Pl. ii. p. 180 (1807) ; S. Moore in Journ. Bot. (1880) p. 230, C. B. Cl. in Fl. Trop. Afr. v. p. 96 (*boerhaaviæfolia*).

Loanda.—No notes. Fl. and fr. Nos. **5129**, **5199**.

Huilla.—Flowers from whitish to slightly violet in colour. In sandy thickets flooded in the rainy season, between Lopollo and Eme, sparingly ; fl. beginning of April 1860. No. **5054**.

2. **B. cuanzensis** Welw. ex S. Moore, *l.c.*, p. 230, excl. var. ; C. B. Cl., *l.c.*, p. 97, excl. var.

Pungo Andongo.—A perennial herb ; stem procumbent, elongated, branched ; leaves coriaceous, rigid ; flowers deep yellow. In wooded open rocky places close to the banks of the river Cuanza, near Mopopo, etc. ; fl. 1 May 1857. No. **5101**.

3. **B. leptophylla** Hiern.

B. cuanzensis, var. *leptophylla* S. Moore, *l.c.* ; C. B. Cl., *l.c.*

Huilla.—In sandy forests of *Parinari Mobola* (Welw. herb. no. 1282) between Lopollo and Eme ; fl. Feb. 1860. No. **5030**. Flowers deep blue. In open mountainous thickets from the lake Ivantâla towards Quilengues ; only two specimens ; fl. end of Feb. 1860. No. **5053**. A perennial herb ; stems prostrate ; leaves verticillate in fours, unequal in length, linear, somewhat rigid, all directed upwards ; flowers handsome, deep blue ; calyx 4-partite, two of the segments larger than the lateral ones, the front one entire, the back one bifid at the apex ; corolla unilabiate, the lip emarginate with a ligule in the notch, the throat deeply bisulcate with three elevated cartilaginous tufts, 2- to 3-dentate or simply emarginate behind ; stamens very slightly didynamous ; filaments cartilaginous, the lower ones dilated and bearing an anther which is obtuse at the apex and laterally stipitate, the upper ones gradually narrowed with the anther adnate at the apex ; anthers all apparently 1-celled, bearded-ciliate ; pollen yellow, viscid, ovoid-oblong, somewhat nodulose. In hot wooded and bushy sandy places between Lopollo and Catumba, plentiful ; fl. March 1860. No. **5056**.

4. **B. glumacea** S. Moore, *l.c.*, p. 232 ; C. B. Cl., *l.c.*, p. 97.

Huilla.—Flowers blue. In open sterile sandy forests by the road between Catumba and Ohay, in company with *Scabiosa Columbaria* L. (Welw. herb. nos. 520, 521), seen nowhere else ; fl. end of April 1860. No. **5052**.

5. **B. Welwitschii** S. Moore, *l.c.*, p. 231 ; C. B. Cl., *l.c.*, p. 99.

Huilla.—A perennial suffrutescent herb ; root thick, woody ; stems several, prostrate ; corolla bright blue. In wooded sandy pastures among short grasses in the Lopollo country, not at all plentiful and observed only in the southern part of the district ; fl. May 1860. No. **5031**.

6. **B. linariæfolia** Pers., *l.c.* ; C. B. Cl., *l.c.*, p. 100.

Acanthodium hirtum Hochst., var. β, Nees in DC. Prodr. xi. p. 274 (1847).

Mossamedes.—An annual herb, 1 to 5 in. high ; stems numerous, ascending ; leaves linear ; flowers violet-blue, arranged in spiny strobiliform spikes. On red sandstone rocks near Boca do Rio Bero ; the last surviving specimens ; fl. end of July 1859. Doubtfully referred here. No. **5005**.

Apparently by some mistake No. 2014 is quoted by C. B. Clarke, *l.c.*, for this species ; but compare No. 5014 under *B. diversispina*, *post* n. 9. The following Acanthacea, without No. in the study set, perhaps belongs here :—

Benguella.—Annual herb; stem and linear leaves whitish-glaucous; flowers unilabiate, pale cyaneous. At Benguella; fl. June 1859.

7. **B. Buchneri** Lindau in Engl. Bot. Jahrb. xx. p. 30 (1894); C. B. Cl., *l.c.*, p. 101.

B. acanthodioides S. Moore, *l.c.*, pp. 229, 393, *partly*; non Klotzsch in Peters, Mossamb. Bot. p. 212 (1861).

Ambaca.—Annual. In dry hilly places on the left bank of the river Caringa, very rare; fr. June 1855. No. **5163**.

Pungo Andongo.—About a foot high; leaves from oval-oblong to elongate-lanceolate, ranging up to 6 in. long by an inch broad. A young plant without fl. Feb. 1857; probably this species. No. **5219**. An annual herb, sometimes simple 1 to 2 ft. high, sometimes much branched 2 to 4 ft. high; flowers large, blue, very ornamental. In pastures and in the more sparingly grassy meadows, tolerably plentiful, especially fine at the banks of streams; by the Catete river: fl. May 1857. No. **5174**. At Canandula; fl. end of May 1857. No. **5112**. Leaves ranging up to 4½ in. long. In fl. No. **5080**. No notes. In fl. No. **5096**.

Huilla.—Flowers bright blue, almost azure-blue. In thickets at the outskirts of the Monino forests, sparingly; fl. April 1860. No. **5061**.

8. **B. noli-me-tangere** S. Moore, *l.c.*, p. 231; C. B. Cl., *l.c.*, p. 103.

Mossamedes.—A much branched shrub, 4 to 6 ft. high; branches divaricate, tortuous, very hardly elastic, virgate-ascending; bark whitish; leaves unequal on the same plant; flowers azure-blue. In gravelly bushy places in little woods composed of *Tamarix orientalis* Forsk. (Welw. herb. no. 1086) and a species of *Cordia* (cf. Welw. herb. no. 4781), on the right bank of the river Maiombo, between Pedra de Sal and the river; late fl. Oct. 1859. No. **5045**.

9. **B. diversispina** C. B. Cl., *l.c.*, p. 104.

Acanthodium diversispinum Nees, *l.c.*, p. 275. *Blepharis* sp. n., S. Moore, *l.c.*, p. 232.

Mossamedes.—Flowers clear blue. In very dry places on a sandy clay soil near Caldeira do inferno; very late fl. and young fr. June 1860. No. **5014** (2014, by error, in Herb. Kew.; compare note under *B. linariæfolia*, *ante* n. 6). An annual herb, scarcely ½ ft. high, branched from the base, glaucous and brittle throughout; leaves linear; flowers crowded in fir-cone shaped clusters at the base of the stems, pale blue. In the sandy rocky parts of Boca do Rio Bero; fl. end of July 1859. No. **5021**.

Var. *β*. **furcata.**

A. diversispinum, var. *β*, Nees, *l.c.* *B. edulis*, var., S. Moore, *l.c.*, p. 229.

Mossamedes.—A prostrate, annual or biennial herb, much branched from the base; flowers unilabiate, pale blue, almost like those of an *Acanthus*. In sandy places at the mouth of the river Bero, at Saco de Giraûl, rather rare; fl. July 1859. No. **5019**.

13. **ACANTHUS** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 1090.

1. **A. montanus** T. And. in Journ. Linn. Soc. vii. p. 37 (1863); S. Moore in Journ. Bot. 1880, p. 232; C. B. Cl. in Fl. Trop. Afr. v. p. 107 (1899).

Cheilopsis montana Nees in DC. Prodr. xi. p. 272 (1847).

Pungo Andongo.—An evergreen branched undershrub, 3 to 4 ft. high, woody at the base ; flowers whitish, marked with purple lines. In the rocky parts of Pedra Cabondo, forming thickets, seen nowhere else ; fl. May 1857. Nos. **5076**, **5167**.

14. **PSEUDOBLEPHARIS** Baill. in Bull. Mens. Soc. Linn. Paris, ii. p. 837 (1890).

1. **P. nitida** Lindau in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 319 (1895).

Acanthus nitidus S. Moore in Journ. Bot. 1880, p. 232. *Sclerochiton nitidus* C. B. Cl. in Fl. Trop. Afr. v. p. 110.

Pungo Andongo.—A small tree, 12 to 15 ft. high ; leaves ranging up nearly a foot long by 3 in. broad ; calyx dialysepalous, imbricate ; corolla white-violet in colour, unilabiate, quite entire and barbulate on the margin behind ; lip anterior and 5-dentate ; stamens 4 ; anthers 1-celled, bearded. In the wooded parts of Barranco de Songue ; fl. May 1857. Nos. **5100**, **5087**

15. **BARLERIA** Plum., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1091.

1. **B. Prionitis** L. Sp. Pl., edit. 1, p. 636 (1753) ; S. Moore in Journ. Bot. 1880, p. 265 ; C. B. Cl. in Fl. Trop. Afr. v. p. 144.

Ameriz.—In fl.-bud. No. **5141**.

Loanda.—A shrub, 2 to 4 ft. high, much branched from the base ; stem and older branches whitish ; shoots and thinly coriaceous leaves glaucous-green ; flowers of a fine orange colour ; calyx 4-partite, bibracteate at the base, the front and back segments longer than the lateral ones and a little shorter than the corolla-tube ; corolla bilabiate, 5-cleft, the tube but little curved upwards, the four lobes which form the lower lip deflected, the fifth lobe which forms the upper lip rather erect and a little shorter ; stamens 4, two of them abortive and included in the lower lip of the corolla, the other two fertile and exserted beyond the upper lip ; anthers oblong, 2-celled, subsagittate at the base ; style exserted ; stigma elongate-cylindrical. In hilly maritime places about Loanda, plentiful ; fl. and fr. Dec. 1853 and Oct. 1857. No. **5138**. At Maianga ; fl. Feb. 1858. No. **5190**. Fl. 1½ in. long. No. **5067**. A glaucous-pruinose shrub, 2 ft. high ; flowers very abundant, of a fine orange colour. In Morro das Lagostas ; fr. Aug. 1854. Coll. Carp. 119.

This is the Acanthacea mentioned by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 250, n. 119.

2. **B. grandicalyx** Lindau in Engl. Bot. Jahrb. xx. p. 25 (1894) ; C. B. Cl., *l.c.*, p. 149.

Var. **vix-dentata** C. B. Cl., *l.c.* *B. Kirkii* S. Moore, *l.c.*, p. 265 ; non T. And.

Huilla.—Flowers pale blue. In thickets of forests composed of *Parinari Mabola* (Welw. herb. no. 1282), between Lopollo and Catumba ; fl. March 1860. No. **5048**.

3. **B. Marlothii** Engl. Bot. Jahrb. x. p. 262 (9 Oct. 1888) ; C. B. Cl., *l.c.*, p. 151.

B. sp. nov. ? aff. *B. acanthoidi* Vahl, S. Moore, *l.c.*, p. 270.

Mossamedes.—A very gloomy, suffrutescent, perennial herb, radiately branched from the base ; stems slender, somewhat woody ; leaves rigid, somewhat fleshy. In rocky places at the base of Serra de Montes negros, rather rare ; fr. 10 Aug. 1859. No. **5024**. A very rigid, elastic

shrublet; flower azure-blue, 1½ in. long. In a very dry rocky part of Caldeira do inferno; only one specimen with fr. and a single fl. June 1860. No. **5013**. A rigid shrublet, 1 to 2 ft. high; flowers bright blue. At Caldeira do inferno; fr. June 1860. Coll. Carp. 838.

4. **B. elegans** S. Moore, *l.c.*, p. 269; C. B. Cl., *l.c.*, p. 154.

B. pungens; var. *macrophylla* Nees in DC. Prodr. xi. p. 237 (1847), *fide* S. Moore, *l.c.*; non L.

Loanda.—An undershrub, 3 to 5 ft. high, subscandent among shrubs, ornamental but injurious to them; leaves in the living state deep green, membranous; corolla deep blue. By thickets in the hilly parts of the district, very plentiful; fl. May and June 1858. No. **5187**. In fl. and fr. No. **5068**. A shrub, 3 to 4 ft. high; flowers very abundant: calyx spiny-ciliate; corolla beautifully blue. At Zamba grande; fr. August 1854. Coll. Carp. 120.

Cazengo.—A rigid herb, 2 to 4 ft. high, woody at the base, sometimes ascending, sometimes erect, usually very much branched at the base; flowers of a pretty blue. In the denser thickets about the Muxaulo chain of mountains, tolerably plentiful; fl. June 1855. No. **5114**.

Bumbo.—In the drier thickets among tall herbs between Bumbo and Bruco; fr. Oct. 1859. Nos. **5034**, **5122**.

This is the Acanthacea mentioned by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 250, n. 120.

5. **B. Carruthersiana** S. Moore, *l.c.*, p. 270; C. B. Cl., *l.c.*, p. 154.

Bumbo.—Flowers blue. In thickets at the outskirts of forests composed of *Copaiba Mopane* O. Kuntze (Welw. herb. no. 605), near Quitibe de Cima; fl. Oct. 1859. No. **5040**.

6. **B. polyneura** S. Moore, *l.c.*, p. 266; C. B. Cl., *l.c.*, p. 157.

Huilla.—A perennial herb; rootstock woody; stems numerous, prostrate-ascending, puberulous; leaves subsessile, ovate, rigidly chartaceous, quite entire, bright green, the uppermost ones glaucescent; corolla white, the tube purplish. In sunny rocky forests between the lake Ivantâla and Quilengues; fl. and young fr. 28 and 29 Febr. 1860. No. **5029**.

7. **B. violascens** S. Moore, *l.c.*, p. 265; C. B. Cl., *l.c.*, p. 158.

Huilla.—A perennial herb, with the habit of an *Ipomœa*; stems several, subangular, prostrate-ascending, rubicund, leafy; leaves glaucescent, erect, somewhat fleshy and rigid; flowers solitary in the axils of opposite leaves, shortly pedicellate, 1½ in. long; calyx 4-bracteolate at the base, diphyllous, the segments elongated ovate-lanceolate and acute; the two lower bracteoles linear, the two upper ones broadly ovate; corolla hypogynous, funnel-shaped or cylindrical-tubular, milk-white; the tube bright violet-purple both outside and inside; the limb deeply 5-cleft; the lobes obtuse, subequal; stamens 4, inserted a little above the base of the corolla tube, 2 of them quite rudimentary and without filaments, the filaments of the other 2 ascending, naked; anthers oblong, 2-celled, quite naked, violet in colour; the cells somewhat diverging at the base, dehiscing longitudinally, both exactly equal; disk cupuliform, repand; ovary 2-celled; ovules 2 in each cell; style simple, whitish; stigma unequally bilabiate, scarcely perforated, pale violet in colour, reflected at the early flowering; capsule globose-compressed at the base, 2-celled, narrowed towards the apex into a conical beak; seeds 2. In elevated

thickets in Morro de Lopollo, at 5000 to 5300 ft. alt., plentiful ; fl. and fr. 17 Feb. 1860. No. **5028**. Corolla like that of a *Convolvulus* or *Ipomœa*, whitish with a strain of violet-blue. In the dry forests of *Parinari Mobola*, towards Eme ; fl. April 1860. No. **5016**.

8. **B. obtusisepala** C. B. Cl., *l.c.*, p. 158.

B. sp. nov. aff. *B. salicifoliæ* S. Moore, *l.c.*, p. 270.

Pungo Andongo.—A perennial, erect herb, becoming rigid throughout ; rootstock thick, woody ; flowers rather large, funnel-shaped, whitish with something of a violet strain. In wooded thickets between Mangue and Calunda ; fl. March 1857. No. **5162**.

9. **B. Welwitschii** S. Moore, *l.c.*, p. 267 ; C. B. Cl., *l.c.*, p. 158.

Pungo Andongo.—Leaves membranous ; flowers milk-white. In rocky bushy places between Lombe and Quibinde ; fl. 9 March 1857. No. **5091**.

10. **B. lancifolia** T. Anders. in Journ. Linn. Soc. vii. p. 28 (4 March 1863).

B. alata S. Moore, *l.c.*, p. 266 ; C. B. Cl., *l.c.*, p. 158.

Golungo Alto.—A deep green shrub, 2 to 3 ft. high ; leaves thinly coriaceous ; flowers milk-white, almost bluish. In primitive forests in the Queta chain of mountains, sporadic ; fl. beginning of June 1856. No. **5147**. A perennial herb ; rhizome woody, creeping ; flowers milk-white varying to violet-blue. In the shady Queta forests ; fl. end of June 1856. No. **5148**. Flowers white, like those of a *Thunbergia*. Among the Queta mountains ; fl. July 1856. No. **5169**.

Pungo Andongo.—A suffruticose herb, branched, at the base woody and a finger thick ; stem and purplish branches nodose, decumbent-ascending over rocks ; flowers from whitish to pale violet in colour ; calyx 4-partite, almost tetraphyllous, the front and back segments much larger than the narrow and shorter lateral ones ; corolla-tube straight, the limb 5-cleft, the lobes obtuse ; perfect stamens 2, inserted at the bottom of the corolla-tube, nearly included ; anthers cordate-ovate, 2-celled, longitudinally dehiscing ; ovary ovoid-conical, girt at the base by the thin raised cup-shaped disk ; style filiform, relatively long, towards the apex gradually terminating in the obtuse obsoletely bilobed usually simple stigma. In bushy rocky places about Barrancos de Catete ; fl. and young fr. middle of May 1857. Nos. **5195**, **5194**.

The following No. probably belongs to this species :—

Cazengo.—Flower-buds about 2 together, subsessile in the terminal axils. At Cambondo ; fl.-buds June 1855. No. **5072**.

11. **B. cyanea** S. Moore, *l.c.*, p. 265 ; C. B. Cl., *l.c.*, p. 159.

Bumbo.—A decumbent-ascending, rigidly elastic shrublet with deep blue flowers. In bushy sandy and rocky places near Quitibe de Cima ; fl. June 1860. No. **5002**.

12. **B. stellato-tomentosa** S. Moore, *l.c.*, p. 268 ; C. B. Cl., *l.c.*, p. 161.

Pungo Andongo.—A suffrutescent herb ; rootstock woody ; stems 3 or 4, erect ; flowers violet-bluish ; corolla 1½ in. long, the tube narrow, the limb an inch in diameter. In open thickets on a clay soil near Lombe, not common ; fl. March 1857. Nos. **5165**, **5095**.

13. **B. salicifolia** S. Moore, *l.c.*, p. 268 ; C. B. Cl., *l.c.*, p. 162.

Libongo.—A slender erect undershrub, 2 to 3½ ft. high, almost a shrub ; stems numerous, as well as the branches hard and rigid ; leaves lasting a long time, the younger ones somewhat rugose and clothed with a yellowish felt ; flowers deep blue, an inch long. In elevated little woods composed of *Euphorbia* (cf. *E. Candelabrum* Welw. herb. n. 641), above the petroleum mine, plentiful ; fl. mostly fallen, Sept. 1858. No. **5119**. An erect, branched, rigid shrub, 3 to 4 ft. high ; tomentum of the younger leaves sulphur-coloured ; flowers labiate, deep azure. In wooded mountainous places about the petroleum mine ; fr. Sept. 1858. Coll. Carp. 833.

Pungo Andongo.—About Lombe and Candumba ; in fl. No. **5102**. About Quibinde and Condo ; in fl.-bud. No. **5103**.

This species is the Acanthacea referred to by Welw. Apontam. p. 589. n. 70 (1859).

14. **B. villosa** S. Moore, *l.c.*, p. 267 ; C.B. Cl., *l.c.*, p. 164.

Golungo Alto.—A subscandent herb, 4 ft. high ; corolla bluish ; two of the stamens elongated with anthers of a deep violet colour. Among the eastern Queta mountains, fl. June 1856. No. **5071**. A perennial herb ; root woody ; stem 2 to 3 ft. high, the primary one rather erect, the others ascending ; calyx tetraphyllous, two of the segments lanceolate one of which is bifid at the apex, the other two linear ; corolla milk-bluish, the tube pale yellowish, the lobes of the limb bluish, marked with violet lines inside ; stamens 5, two of them fully developed, the other three much shorter, one of these without an anther and two with anthers much smaller than those of the longer stamens but nevertheless polliniferous. In elevated bushy rather dry places in Sobato de Quilombo ; fl. middle of July 1856. No. **5070**.

16. **NEURACANTHUS** Nees ; Benth. & Hook. f. Gen. Pl. ii. p. 1093.

1. **N. decorus** S. Moore in Journ. Bot. 1880, p. 307 (Oct.) ; C. B. Cl. in Fl. Trop. Afr. v. p. 138.

Huilla.—A perennial herb, 10 to 18 in. high ; root rather thick ; stems several, strictly erect ; leaves somewhat rigid, dark green above, yellowish green beneath ; flowers spicate ; bracts with long cilia on the margin ; calyx-lobes ciliate ; corolla ringent, whitish purple ; ovary ellipsoidal, acuminate at both ends. In hilly rocky bushy places between the great lake of Ivantâla and Quilengues, rather rare ; fl. end of Febr. 1860. No. **5057**.

2. **N. scaber** S. Moore, *l.c.*, p. 307 ; C. B. Cl., *l.c.*, p. 138.

Loanda.—A suffrutescent herb ; rootstock woody ; stems 6 to 15, somewhat erect or ascending ; flowers from milk-white to very pale bluish : corolla almost salver-shaped, the tube straight, the limb entire plane-subconcave and nearly square. In the more elevated hilly parts of the district ; near Boa Vista ; fl. and fr. end of May 1858. Nos. **5171**, **5064**, **5125**, **5128**.

17. **ASYSTASIA** Blume ; Benth. & Hook. f. Gen. Pl. ii. p. 1094. *Intrusaria* Rafin. Fl. Tellur. iv. p. 66 (1836).

1. **A. coromandeliana** Nees in Wall. Pl. As. Rar. iii. p. 89 (1832) ; C. B. Cl. in Fl. Trop. Afr. v. p. 131 (1899).

Justicia gangetica L. Cent. Pl. alt. p. 3, n. 102 (2 June 1756).

Ruellia secunda Vahl, Symb. Bot. iii. p. 84 (1794). *R. coromandeliana* Wall. List n. 2399 *partly* (1830). *A. gangetica* T. And. in Thwaites, Enum. p. 235 (1860); S. Moore in Journ. Bot. 1880, p. 308.

Icolo e Bengo.—At Santo Antonio; fr. Dec. 1853. No. **5170**. In palm groves at the river Bengo, sparingly; fr. Dec. 1853. No. **5201**.

Golungo Alto.—An ascending herb, a foot and a half high, with whitish flowers. In bushy reed-beds; fl. May 1856. No. **5196**. In fr. 1857. No. **5160**. In fl. and fr. No. **5131**.

Huilla.—Flowers whitish violet in colour; fruit scarcely an inch long, $\frac{1}{12}$ in. broad. In the more open forests of the Monino; fl. and fr. Dec. 1859. No. **5050**.

Prince's Island.—In fl. Sept. 1853. No. **5206**.

2. **A. africana** C. B. Cl., *l.c.*, p. 134.

Isochoriste africana S. Moore, *l.c.*, p. 309.

Pungo Andongo.—A diffuse herb, 2 to 3 ft. high, with rosy flowers. In wooded bushy places near Quilange; fl. Febr. 1857. No. **5073**. In fr. No. **5078**. In fl. No. **5079**.

3. **A. Welwitschii** S. Moore, *l.c.*, p. 308, t. 213; C. B. Cl., *l.c.* p. 134. Cf. Welw. Apontam. p. 591, n. 103 (1859).

Pungo Andongo.—A sparingly branched herb, 2 to 3 ft. high, with the aspect of a *Mimulus*; flowers whitish rosy. By thickets near Cazella; fl. Oct. 1856. No. **5188**. An erect or ascending herb, 2 to 4 ft. high; rootstock woody; stems numerous; flowers white or rarely purplish. In thickets about the præsidium, everywhere very plentiful; fl. and fr. Febr. 1857. No. **5105**. A perennial herb, 3 ft. high; flowers spreading horizontally and somewhat drooping, in shape almost like those of a *Gladiolus*, whitish rosy. In wooded thickets near Pungo Andongo, plentiful; fr. April 1857. Apparently this species. Coll. Carp. 836. Herbaceous; flowers white. At Cazella. Apparently the same. Coll. Carp. 837.

Huilla.—Flowers white. In bushy thickets near Lopollo, rather rare; fl. Nov. 1859. No. **5039**.

The following No. possibly belongs to this genus, but it is represented by a very poor specimen.

Pungo Andongo.—A decumbent herb, with white flowers. In sandy wooded places near Mopopo and Sansamanda; fl. Feb. 1857. No. **5159**.

18. **PSEUDERANTHEMUM** Radlk. in Sitzber. Bayr. Akad. W. xiii. p. 282 (1883).

Eranthemum R. Br. Prodr. p. 477 (1810); Benth. & Hook. f. Gen. Pl. ii. p. 1097; non L. (1753). *Siphoneranthemum* O. Kuntze, Rev. Gen. Pl. iii. 2, p. **122** (1898).

1. **P. nigritianum** Radlk., *l.c.*, p. 286.

Eranthemum nigritianum T. And. in Journ. Linn. Soc. vii. p. 51 (1863); S. Moore in Journ. Bot. 1880, p. 308; C. B. Cl. in Fl. Trop. Afr. v. p. 171.

Pungo Andongo.—An erect or decumbent undershrub, slender, 1 to 2 ft. high, woody at the base; leaves thinly coriaceous, somewhat glossy, ranging up to $4\frac{1}{2}$ in. long by $1\frac{1}{2}$ in. broad; petioles ranging up

to ½ in. long ; flowers blue or deep violet-bluish. In the damp shady primitive forest of Mata de Pungo in the præsidium ; fl. May 1857. Nos. **5177**, **5192**.

19. **LEPIDAGATHIS** Willd.; Benth. & Hook. f. Gen. Pl. ii. p. 1101.

1. **L. pallescens** S. Moore in Journ. Bot. 1880, p. 308, C. B. Cl. in Fl. Trop. Afr. v. p. 127.

Pungo Andongo.—A strictly erect herb, apparently perennial, with whitish rosy flowers. In sandy places at the sides of forests near Quitage, rather sparingly ; fl. March 1857. No. **5084**.

2. **L. scabra** C. B. Cl., *l.c.*, p. 129.

Neuracanthus scaber Lindau in Engl. Pfl. Ost. Afr., C., p. 369 (1895), partly.

Pungo Andongo.—Flower whitish. In the moist forest between Candumba and Mangue near the river Molemba, in company with a Bambusacea (cf. *Oxytenanthera abyssinica* Munro ; Welw. herb. no. 1134) ; fl.-bud and only one fl. (not seen by me), March 1857. No. **5104**.

20. **MONOTHECIUM** Hochst.; Benth. & Hook. f. Gen. Pl. ii. p. 1104.

1. **M. aristatum** T. And. in Thwaites, Enum. Pl. Zeyl. p. 234 (1860) ; S. Moore in Journ. Bot. 1880, p. 309 ; C. B. Cl. in Fl. Trop. Afr. v. p. 176.

Justicia aristata Wall. List, n. 2481 (1830) ; Nees in Wall. Pl. As. Rar. iii. p. 115 (1832) ; non Vahl. *Anthocometes aristatus* Nees in DC. Prodr. xi. p. 312 (1847).

Golungo Alto.—An erect herb ; rhizome woody ; leaves membranous, bright green, much paler beneath ; flowers white, caducous. In wooded places among the mountains of the western Queta above N-delle, not uncommon ; fl. beginning of June 1856. Nos. **5155**, **5198**. At Calomba on the Luinha ; fr. July 1856. No. **5134**. A slender undershrub, with rigid flexuous branches. In shady wooded places close to the rivulet Quiapoza near Sange ; imperfect inflorescence affected with a gall ? Feb. 1856. Doubtfully referred here. No. **1228**.

Pungo Andongo.—In fr. No. **5197**.

21. **BRACHYSTEPHANUS** Nees ; Benth. & Hook. f. Gen. Pl. ii. p. 1105.

1. **B. occidentalis** Lindau in Engl. Bot. Jahrb. xx. p. 53 (16 Nov. 1894) ; C. B. Cl. in Fl. Trop. Afr. v. p. 179.

Island of St. Thomas.—Leaves ranging up to 3 in. long by 1½ in. broad or rather broader ; inflorescence terminal, oblong, many-flowered, rather dense, 2 in. long. On the coast in wooded places ; fl. Dec. 1860. No. **5208**.

22. **JUSTICIA** Houst., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1108, excl. sect. Monechma.

1. **J. nilgherrensis** Wall. List, n. 2435 (1830), and ex Nees in Wall. Pl. As. Rar. iii. p. 103 (1832) ; C. B. Cl. in Fl. Trop. Afr. v. p. 185 (1899).

Adhatoda nilgherrensis Nees, *l.c.* *A. nilgherrica* Nees in DC. Prodr. xi. p. 386 (1847). *J. Betonica* S. Moore in Journ. Bot. 1880, p. 309, forma i. p. 310, var. *neilgherriensis* T. And. in

Journ. Linn. Soc. vii. p. 118 (1863); non L. *Nicoteba nilgherrensis* Lindau in Engl. Nat. Pflanzenfam. iv. 3 *b*, p. 329 (1895).

Huilla.—In fl. No. **5043**.

2. **J. andongensis** C. B. Cl., *l.c.*, p. 185.

J. Betonica S. Moore, *l.c.*, p. 309, forma ii. p. 310; non L.

Pungo Andongo.—At Mangue; fr. No. **5111**.

3. **J. versicolor** C. B. Cl., *l.c.*, p. 186.

Nicoteba versicolor Lindau in Engl. Bot. Jahrb. xxii. p. 118 (1895).

Huilla.—Flowers whitish-violet in colour. In dry hilly places near Páo above the river Maiomba; fl. and fr. June 1860. No. **5049**.

4. **J. tenella** T. And., *l.c.*, p. 40; C. B. Cl., *l.c.*, p. 187.

Rostellularia tenella and *R. crenulata* Nees in DC. Prodr. xi. p. 369 (1847). *R. parviflora* Benth. in Hook. Niger Fl. p. 481 (1849).

Island of St. Thomas.—In fr. Dec. 1860. No. **5200**.

5. **J. læta** S. Moore, *l.c.*, p. 311; C. B. Cl., *l.c.*, p. 188.

Pungo Andongo.—A perennial herb, 2 to 3 ft. high; rhizome woody; stems numerous; flowers violet in colour. In bushy hilly places between Condo and Quibonde; fl. March 1857. No. **5108**. A suffrutescent herb, up to 4 ft. high; flowers rosy-violet, very abundant. Among the rocks of Fonte de Casamba in the præsidium; fl. beginning of May 1857. No. **5081**.

6. **J. flava** Vahl, Symb. Bot. ii. p. 15 (1791); C. B. Cl., *l.c.*, p. 190; non Kurz (1873).

Dianthera americana, var. *a.*, Forsk. Fl. Ægypt.-Arab. p. 9 (1775); non L. (1753). *D. flava* Vahl, *l.c.*, i. p. 5 (1790). *J. plicata* Vahl, Enum. i. p. 156 (1804), var.; S. Moore, *l.c.*, p. 310.

Loanda.—In the city; fl. and fr. April 1854. No. **5135**. At Teba; fr. Coll. Carp. 830.

Golungo Alto.—In fl. and fr. No. **5183**.

Pungo Andongo.—Stem creeping, rooting at the nodes; leaves ranging up to 2 in. long by 1½ in. broad. Fl. and fr. Dec. 1856. No. **5097**. In fl.-bud. No. **5074**.

Huilla.—Flowers yellow. In wooded pastures near Mumpulla; fl. and fr. Oct. 1859. No. **5035**. In hilly pastures among low bushes; fl. and fr. Dec. 1859. No. **5036**.

The following No., represented by an imperfect specimen, must be compared with this species; S. Moore, *l.c.*, p. 363, compared it with his *Hypoëstes callicoma* :—

Huilla.—Flowers ochroleucous, solitary. In the open forest between Eme and Ivantâla, only one specimen; fl. and fr. end of Feb. 1860. No. **5060**.

7. **J. Lazarus** S. Moore, *l.c.*, p. 313; C. B. Cl., *l.c.* (*ined.*), n. 33.

J. insularis S. Moore, *l.c.*, p. 341; non T. And.

Golungo Alto.—A herb, apparently annual; stem somewhat prostrate, divaricately branched; flowers whitish. In sandy places at the banks of the river Cuango, very rare; fl. Nov. 1854. A small form of the species. No. **5211**. In fl. No. **5117**. In fl. and fr. No. **5143**.

Pungo Andongo.—A herb, 3 ft. high or more, apparently annual.

In fl. and fr. Perhaps a large form of the species, with the underside of the leaves hairy. No. **5093**.

Huilla.—Flowers whitish-rosy. On a sandy soil in open forests composed of *Parinari Mobola* (Welw. herb. no. 1282); only two specimens, fl. April 1860. No. **5058**. Annual; flowers whitish. In rather shady wooded places near Catumba, very sparingly; fl. end of April 1860. No. **5051**.

8. **J. brevicaulis** S. Moore, *l.c.*, p. 341; Engl. Hochgebirgsflora, p. 393 (1892); C. B. Cl., *l.c.*, n. 51.

Huilla.—A perennial herblet; rhizome thick, woody; stems numerous, erect; flowers ringent, violet in colour. In hilly rocky places between Mumpulla and Nene, among low herbs, rather rare; fl. and young fr. towards end of Oct. 1859. No. **5774**.

9. **J. extensa** T. And. in Journ. Linn. Soc. vii. p. 44 (1863); S. Moore, *l.c.*, p. 341; C. B. Cl., *l.c.*, n. 64.

Var. ? **castellana**.

A weak undershrub, slightly puberulous, with the habit nearly of a *Brillantaisia*, widely subscandent; stems elongated, numerous, flexuous, cylindrical, fleshy-woody, woody in the lower part, grey-green, narrowly furrowed, bright green and smooth on the upper part, conspicuously thickened at the nodes throughout, 7 to 10 ft. long; leaves opposite, ovate or elliptical, usually more or less obtusely acuminate at the apex, obtusely narrowed or subcordate at the base, somewhat fleshy, not coriaceous, deep green above, rather paler beneath, entire or sub-repand, 4 to 6 in. long by $1\frac{2}{3}$ to 3 inches broad, those next the inflorescence smaller; petiole limp, $\frac{3}{4}$ to $2\frac{1}{4}$ in. long, shortly puberulous; inflorescence terminal and axillary, paniculate, rather lax, many-flowered, somewhat leafy, shortly puberulous, divaricately branched, pyramidal or corymbose,; bracteoles subulate; ultimate pedicels very short or bent at the apex; calyx green, deeply 5-cleft, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, puberulous; the segments oblong, pointed, ribbed, subequal, the lowest one a little narrower than the rest; corolla $\frac{3}{8}$ in. long, pale greenish-sulphur in colour, marked inside with purple longitudinal lines, inserted outside the disk, tubular, bilabiate; the the tube plicate-costate; the upper lip erect, shortly bilobed at the apex; the lower lip 3-lobed, callous and obliquely plicate at the base of the middle lobe, with the lobes linear and deflected; stamens 2, fertile, inserted on the lower corolla-lip a little below the base of its lateral lobes, included; filaments somewhat compressed, hairy, expanded at the apex into the green fleshy unequally didymous connective, $\frac{1}{6}$ in. long; anthers 2-celled; the cells separate, one of them inserted on the connective lower than the other, both subulate-aristate at the base, longitudinally dehiscing; staminodes 0; pollen ellipsoidal, minutely punctate, the tubercles not conspicuous at least near the pores; disk cupuliform, tolerably high, embracing the base of the ovary; ovary hairy, 2-celled, ovoid-conical; cells 2-ovuled; style filiform, a little curved; stigma somewhat obtuse, very narrowly or obsoletely bilobed; immature seeds flattened, broadly membranous-alate.

Pungo Andongo.—In wooded rocky rather elevated places at the cataracts of streams near Cabondo in the præsidium, sporadic and rather rare; fl. end of April 1857. No. **1248**.

10. **J. Anselliana** T. And., *l.c.*, p. 44; Lindau, *l.c.*, p. 349, fig. 112 D; S. Moore, *l.c.*, p. 341; C. B. Cl., *l.c.*, n. 70.

Adhatoda Anselliana Nees in DC. Prodr. xi. p. 403 (1847). *Dianthera* (sp.), Benth. & Hook. f., *l.c.*, p. 1114.

Ambaca.—A herblet of scarcely 3 to 4 in.; stem creeping, stoloniferous; flowers white. In damp pastures on the left bank of the river Lucala; fl. Oct. 1856. No. **5172**.

Pungo Andongo.—A very slender herb, floating, apparently perennial; rhizome creeping far, rooting at the nodes; stems more or less elongated according to the depth of the water; fruiting peduncles reflected. In pools at the great cataract of the river Cuanza near Condo; fl. and fr. March 1857. No. **5173**.

Var. **angustifolia** S. Moore, *l.c.*, p. 342.

Pungo Andongo.—A herb; stem filiform, ascending when growing in spongy marshes or floating on pools; flowers white. Between Lombe and Candumba, in company with *Marsilea* (cf. Welw. herb. no. 39), etc.; fl. and fr. March 1857. No. **5098**.

23. **MONECHMA** Hochst. in Flora 1841, p. 374.

Justicia sect. *Monechma*, Benth. and Hook. f. Gen. Pl. ii. p. 1109.

1. **M. lolioides** C. B. Cl. ms. in. Fl. Trop. Afr. v. p. (ined.).

Justicia lolioides S. Moore in Journ. Bot. 1880, p. 310, t. 214, fig. 1.

Pungo Andongo.—An erect or ascending herb, with violet-purple flowers. In moist hot wooded parts of Mata de Mutollo; fl. and fr. Jan. 1857. Nos. **5178**, **5090**.

Var. **latifolia** (S. Moore, *l.c.*).

Pungo Andongo.—An erect or ascending herb, a foot high, growing in dense masses; flowers white. In somewhat dry wooded pastures with sparse herbage between Quisonde and Condo; fl. and fr. March 1857. No. **5099**.

2. **M. scabridum** C.B. Cl. ms., *l.c.*

Justicia scabrida S. Moore, *l.c.*, p. 310.

Pungo Andongo.—A herb, 2 to 3 ft. high, the whole plant becoming yellowish in the course of drying; stems branched in a broom-like manner; flowers in the living state white. By thickets near Condo, N-billa, and Bumba, rather rare; fl. March 1857. No. **5085**. A perennial herb, erect; corolla white. At Condo, fl. 11 March 1857. No. **5092**.

3. **M. Welwitschii** C. B. Cl. ms., *l.c.*

Justicia monechmoides S. Moore, *l.c.*, p. 311.

Loanda.—An erect, bright green herb, 1½ to 2 ft. high, with whitish inconspicuous flowers. In moist bushy places at Imbondeiro dos Lobos; fl. and fr. March 1858. Nos. **5184**, **5065**, **5123**, **5140**.

4. **M. spissum** C. B. Cl. ms., *l.c.*

Justicia sp. (§ Rostellaria), S. Moore, *l.c.*, p. 342.

Loanda.—A much-branched, annual, somewhat erect herblet, 4 in. high; root 3 in. long; leaves imbricate. In a wet wooded spot between Teba and Quicuxe, only one specimen found; fr. March 1854. No. **5066**.

5. **M. Nepeta** C. B. Cl. ms., *l.c.*

Justicia Nepeta S. Moore, *l.c.*, p. 312. *J. mossamedea* S. Moore, *l.c.*, p. 342.

Icolo e Bengo.—An erect, annual herb, much branched, conical in outline, a foot high. By moist thickets near Prata not far from Lagoa de Quilunda, rather rare; fr. Sept. 1854. No. **5136**.

Loanda.—An erect or ascending, annual herb; corolla violet-purple, bilabiate; the upper lip much shorter than the lower, obtusely bilobed; the lower lip widely spreading, 3-lobed. In thickets on a sandy or ferruginous clay soil, near Boa Vista, very rare; fl. and fr. end of May, 1858. Nos. **5185**, **5137**.

Mossamedes.—An annual or biennial herb, obliquely climbing or erect, much branched from the base; branches decurrent; leaves spathulate; corolla yellowish at the base, at the apex especially on the limb violet-purple. At the sides of the calcareous mountains between Mossamedes and Cavalheiros; fl. and fr. beginning of July 1859. No. **5003**. An annual herb, branched from the base; flowers violet-purple. Arimo de Senhor Viana; fl. and fr. beginning of Aug. 1859. No. **5004**.

6. **M. floridum** C. B. Cl. ms., *l.c.*

Justicia (§ Rostellaria) sp., S. Moore, *l.c.*, p. 342.

Libongo.—An annual herb, 1 to 3 ft. high, much branched, strong smelling; flowers pale purple. In rather dry places among low bushes, above Banza do Libongo, in Arimo do Senhor Freire; fl. and fr. Sept. 1858. No. **5120**. An annual, erect or ascending, much branched herb, hoary more or less throughout; leaves narrow; flowers small, purplish. In thickets near Banza de Libongo; fr. Sept. 1858. Coll. Carp. 832.

Bumbo.—In fields after crops of *Arachis hypogœa*; fl. and fr. No. **5032**.

7. **M. cleomoides** C. B. Cl. ms., *l.c.*

Justicia cleomoides S. Moore, *l.c.*, p. 313, t. 214, fig. 2.

Mossamedes.—A low, very densely branched shrub, 1 to 2 ft. high, forming hemispherical clumps; stem and leaves glandular-pilose, very viscid; corolla whitish, the lower lip violet in colour; disk yellowish; stamens 2. In sandy submaritime places between Mossamedes and Cavalheiros; fl. and fr. beginning of July 1859. No. **5006**.

8. **M. Salsola** C. B. Cl. ms., *l.c.*

Justicia Salsola S. Moore, *l.c.*, p. 340.

Mossamedes.—A prostrate, suffruticose herb, very rigid throughout; fruit axillary, solitary. In dry hilly maritime places at Praia da Amelia; fr. July 1859. No. **5023**.

24. **RHINACANTHUS** Nees; Benth. & Hook. f. Gen. Pl. ii. p. 1112.

1. **R. communis** Nees in Wall. Pl. As. Rar. iii. p. 109 (1832); S. Moore in Journ. Bot. 1880, p. 342. *Justicia nasuta* L. Sp. Pl. edit. 1, p. 16 (1753). *R. Nasuta* S. Kurz in Journ. As. Soc. Beng. xxxix. 2, p. 179 (1870). *R. nasutus* Lindau in Engl. Nat.

Pflanzenfam. iv. 3 *b*, p. 339 (1895); O. Kuntze, Rev. Gen. Pl. ii. p. 494 (1891).

Pungo Andongo.—A slender ascending herb, with white flowers. In Mata de Pungo; fl. May 1857. No. **5191**.

Bumbo.—Branches spreading; flowers whitish, numerous, arranged in rather lax cymes. In Serra de Xella; fl. Oct. 1859. A hairy, large-flowered form of the species. No. **5010**.

Prince's Island.—In fl. Sept. 1853. No. **5204**.

25. **ECBOLIUM** S. Kurz; Benth. & Hook f. Gen. Pl. ii. p. 1118; non L. (1735).

1. **E. amplexicaule** S. Moore in Journ. Bot. 1894, p. 136.

Justicia sp., S. Moore, *l.c.* (1880), p. 342.

Loanda.—An undershrub, 2 to 4 ft. high, pretty much branched; stem and branches glaucous, more or less fleshy at the nodes; leaves from greenish to glaucescent, very readily caducous, cordate-auriculate; petioles short, fleshy, articulate to the swellings of the stem; calyx 5-cleft, bibracteolate; corolla elongate-funnelshaped, the lobes of the limb obtuse; stamens 2, inserted on the throat of the corolla or a little below it; anthers 2-celled, the cells parallel, one of them a little higher than the other; ovary 2-celled, somewhat hairy; stigma bifid, terminating the very long style. In sandy thickets near Penedo, and in public but little frequented places in the city of Loanda; fl. and fr. Dec. 1858. Nos. **5203, 5124**.

This is possibly the Acanthacea mentioned by Welwitsch in Ann. Cons. Ultramar. No. 7 (August 1854), p. 83, n. 78, as occurring in thickets near Loanda in October 1853.

26. **PERISTROPHE** Nees; Benth. & Hook. f. Gen. Pl. ii. p. 1121.

1. **P. bicalyculata** Nees in Wall. Pl. As. Rar. iii. p. 113 (1832); J. A. Schmidt, Fl. Cap Verd. (1852), p. 247.

Justicia bicalyculata Vahl, Symb. Bot. ii. p. 13 (1791). *Dianthera bicalyculata* Retz in Act. Holm. 1775, p. 297. *D. paniculata* Forsk. Fl. Ægypt.-Arab. p. 7 (1775). *J. malabarica* Chr. Sm. in Tuckey, Congo, p. 250 (1818).

Cape de Verde Islands.—In gravelly depressions behind Cidade da Praia in the island of S. Thiago; fr., nearly without leaves, Jan. 1861. No. **5176**.

28. **HYPOËSTES** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 1122.

1. **H. verticillaris** Soland. ex Roem. & Sch. Syst. Veg. i. 140 (1817); S. Moore in Journ. Bot. 1880, p. 363. *Justicia verticillaris* L. f. Suppl. Pl. p. 85 (1781). *H. mollis* T. And. in Journ. Linn. Soc. vii. p. 49 (1863); S. Moore, *l.c.*

Golungo Alto.—In rather dry wooded places in Sobato Cabango Cacalungo; fl. June 1856. Nos. **5144, 5118, 5142**.

Var. *β.* **denudata** Nees in DC. Prodr. xi. p. 507 (1847).

H. verticillaris, var. *glabra*, S. Moore, *l.c.*

Huilla.—Flowers whitish. In rocky bushy places between Lagoa de Ivantâla and Quilengues, close to the banks of the river Caculuvar, sparingly; fl. end of Feb. 1860. No. **5059**.

27. **DIAPEDIUM** Konig in Kon. & Sims, Ann. Bot. ii. (No. iv. June 1st, 1805), p. 189.

Dicliptera Juss. in Ann. Mus. Par. ix. p. 267 (1807); Benth. & Hook. f. Gen. Pl. ii. p. 1120.

1. **D. umbellatum** O. Kuntze, Rev. Gen. Pl. ii. p. 485 (1891).

Justicia umbellata Vahl, Enum. i. p. 115 (1804). *Dicliptera umbellata* Juss., *l.c.*, p. 268. *Dicliptera verticillaris* S. Moore in Journ. Bot. 1880, p. 362; non R. & S.

Golungo Alto.—Herbaceous, annual or biennial, beset with glandular hairs having a goatish smell; corolla rosy, bilabiate, the upper lip lanceolate and whitish-punctate at the base, the lower lip patent entire and rose-red throughout. In damp densely shady places near Sange, Bango, Camilungo, etc.; fl. and fr. Jan. 1855. No. **5116**. At Quibolo. Fl. and fr. July 1856. No. **5133**.

Mossamedes.—An annual, erect or ascending herb, 2 to 2½ ft. high, sparingly branched, herbaceous-green; flowering branches patent, the upper ones the shorter; flowers apparently rosy. At the rocky sides of the river Bero near Boca do Rio (the last gorge), sparingly; fl. end of July 1859. No. **4999**.

The plant is officinal; in Golungo Alto the natives call it "Quixixila."

2. **D. Welwitschii.**

Dicliptera Welwitschii S. Moore, *l.c.*, p. 362.

Huilla.—Corolla violet in colour. In forests about Ivantâla; fl. Feb. 1860. No. **5015**. This No. is quoted also by S. Moore, *l.c.*, p. 266, for *Barleria violascens*.

3. **D. angolense.**

Dicliptera angolensis S. Moore, *l.c.*, p. 362.

Golungo Alto.—At Bumba; fl. July 1856. Nos. **5132**, **5168**, "cf. **5116**" (*not* **5116**).

XCV. SELAGINEÆ.

This family, which is abundantly represented in the Cape flora, was previously to Welwitsch's discoveries unknown in West Tropical Africa; the three species which were found in Huilla are among the most delightful of its plants, and embellish those highlands with indescribable charms. The negresses, who are in general but little susceptible to the beauties of nature, are in the habit of weaving in their head-dresses the flowering branches of the two following species of *Selago*, or stick them behind their ears, as they carry goods to the market at Lopollo.

1. **HEBENSTRETIA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 1127.

1. **H. dentata** L. Sp. Pl., edit. 1, p. 629 (1753).

Var. **integrifolia** Choisy in DC. Prodr. xii. p. 4 (1848).

H. integrifolia L., *l.c.* *H. angolensis* Rolfe in Journ. Bot. 1886, p. 174 (*Hebenstreitia*).

Huilla.—A herb, apparently annual or doubtfully perennial; stem erect, simple at the base, branched from the middle upwards: branches spreading, virgate, leafy, terminating in flowering spikes; leaves linear; flowers very elegant; corolla whitish, unilabiate, 4-lobed at the apex,

the lobes revolute, the disk of the lip covered with a long and broad spot deep-orange or even scarlet in colour ; fertile fruit with a corky bark. By the Humpata stream, abundant but only in a few places ; fl. and fr. 24 April 1860. No. **4786** and Coll. Carp. 60, 839. A suffruticose herb ; stem 2 ft. high, erect or ascending, branched, bearing from the base upwards alternate linear long leaves and at the apex of the branches spikes of flowers ; calyx bivalved ; corolla unilabiate, the lip white, the disk marked with a brick-red spot, the limb 4-cleft and suberect ; stamens 4, scarcely didynamous ; anthers linear, unilocular, debiscing longitudinally ; style rather thickly filiform, inclined forwards ; stigma obsoletely bilobed. In bushy places by streams, rather rare ; fl. Jan. 1860. No. **4787**.

2. **SELAGO** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1128 ; non Dillen.

Pechuelia O. Kuntze in Jahrb. Bot. Gart. Berlin, iv. p. 270 (1886).

1. **S. alopecuroides** Rolfe in Journ. Bot. 1886, p. 175 ; O. Kuntze in Jahrb. Bot. Gart. Berlin, iv. p. 270 (1886) ; Engl. Bot. Jahrb. x. p. 265 (9 Oct. 1888).

Pechuelia alopecuroides O. Kuntze, *l.c.*, p. 271.

Huilla.—A perennial herb ; stems numerous, erect or ascending, 1 to 2 feet high, very densely leafy ; leaves very narrowly linear, herbaceous-green ; flowers sub-ringent, whitish violet in colour. In rocky thickets near Lopollo ; fl. middle of Dec., fr. 29 Dec. 1859. No. **4789**. A decumbent undershrub, 1 to 1½ ft. high ; branchlets ascending, virgate, densely leafy, pyramidally spicate at the apex ; leaves narrowly linear, fasciculate, almost heath-like ; flowers crowded, very elegant, purplish. In the more elevated thickets and in open places about Lopollo, plentiful ; fl. Jan. 1860 ; also in sandy wooded pastures between Lopollo and Morro de Quilengues, rather sparingly as a prostrate plant ; fl. 29 Dec. 1859. No. **4790**. Stem erect ; flowering spikes slender, pyramidal. Lopollo ; fr. April 1860. A plant well worth cultivating. Coll. Carp. 69.

No. 4789 has been referred to the var. *filifolia* O Kuntze, *l.c.*, p. 271, characterised by terete leaves.

2. **S. Welwitschii** Rolfe, *l.c.*

Huilla.—A lovely shrublet ; root thickened, woody ; stems several, decumbent or prostrate ; branches virgate, floribund ; branchlets crowded, ascending, corymbosely flowering at the apex ; leaves linear or lanceolate-spathulate, fasciculate, greenish sub-glaucescent ; flowers bright violet-rosy ; corolla sub-bilabiate, the 4 upper lobes approximated, the lower one deflected ; anthers 1-celled. In hilly sandy thickets about Lopollo, ubiquitous ; fl. 28 Dec. 1859 and 2 Jan. 1860. No. **4788**. An annual or biennial plant ; stems decumbent, branched ; branchlets horizontal ; flowers very densely crowded, of a very pretty violet colour. In sandy-muddy thickets near Lopollo ; fr. April 1860. It would be very ornamental in cultivation. Coll. Carp. 62.

Coll. Carp. 3 (In marshes, Lopollo ; specimens not found) probably belongs to this species.

3. **GLOBULARIA** Tournef., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1130.

1. **G. salicina** Lam. Encycl. Méth. ii. p. 732 (1786).

G. longifolia Ait. Hort. Kew. i. p. 130 (1789). *G. amygdalifolia* Webb. in Hook. Niger Fl. p. 133 (1849). *Lytanthus salicinus*

Wettst. in Engl. Nat. Pflanzenfam. iv. 3 *b*., p. 272, fig. 103 C (1895). *L. amygdalifolius* Wettst. in Engl., *l.c.*, p. 273.

Island of Madeira.—A lovely shrub, 1½ to 2½ ft. high; branches ascending; leaves coriaceous, rigid, rather glossy. In stony places not far from the ocean, by the road which leads from Funchal to Camara dos Lobos, abundant; fl. end of August 1853. No. **784**.

XCVI. VERBENACEÆ.

1. **LANTANA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 1142.

1. **L. Camara** L. Sp. Pl., edit. 1, p. 627 (1753).

L. antidotalis Schum. & Thonn. in Danske Vidensk. Selsk. iv. p. 50 (1829).

Loanda.—A shrub, 4 to 6 ft. high; root woody; stems several, erect or oblique, distinctly hexagonal or obtusely tetragonal; branches and branchlets patent; leaves almost always (according to Welwitsch) ternate, sometimes opposite; flowers yellow, almost tending to orange in colour; bracts linear-lanceolate, shorter than the corolla-tube; drupels deep blue. In thickets not far from the ocean, extending at intervals from Ambriz to the mouth of the river Cuanza; at Penedo; fl. Feb. 1858. Used as an officinal plant by the negroes; scent very agreeable. No. **5722**. In fl. and fr. Nos. **5650**, **5715**, **5658**.

Pungo Andongo.—In fr. Dec. 1856. No. **5692**. A much branched shrub, 5 ft. high, with numerous stems and orange-coloured flowers. In thickets at the outskirts of Mata de Pungo; fl. Jan. 1857. No. **5723**. A simple erect shrublet, 6½ in. high, apparently perennial: leaves membranous; flowers orange-yellow. In a rocky part of the præsidium, at Barrancos da Pedra Pungo; only one specimen, fl. May 1857. No. **5621**. In fl. and young fr. No. **5676**.

Mossamedes.—A shrub, 4 to 6 ft. high, subscandent or rather with virgate sarmentose branches; flowers saffron- or orange-yellow; drupels black-bluish. At the banks of the river Bero, plentiful; fl. and fr. June 1859. No. **5765**.

Cape de Verde Islands.—Prickly, shrubby; fr. baccate. In St. Jago; fl. and fr. Jan. 1861. Belongs to this or an allied species. No. **5626**.

2. **L. salvifolia** Jacq. Hort. Schoenbr. iii. p. 18, t. 285 (1798).

Loanda.—A much branched undershrub, scarcely a shrub, woody at the base; branches divaricate; corolla white, yellow at the bottom. At the lowest parts of the mountains between Penedo and Forte Conceição; fl. and fr. 22 April 1858. No. **5720**.

Golungo Alto.—Roadway near Mussengue; fl. April 1855. A broad-leaved form of the species. No. **5742**. An undershrub, 2 to 4 ft. high, at first erect or even strict, afterwards almost a shrub with twisted arching branches; flowers milk-white. At the outskirts of forests in Sobato de Quilombo and at the river Cuango, etc.; fl. and fr. April 1856. Nos. **5666**, **5643**, **5727**, and Coll. Carp. 841.

Cazengo.—A suffruticose herb, 3 to 4 ft. high. By thickets near Cacula; fl. June 1855. A broad-leaved form. No. **5743**.

Pungo Andongo.—An undershrub, 1 to 2 ft. high; root woody; stems numerous, prostrate or ascending; flowers very prettily violet-rosy, scentless; fruit baccate, edible, resembling a mulberry but the drupels larger violet-rosy shining like pearls and separated from each other by broad projecting bracts, with a very pleasant acid taste suggesting

that of the berries of the Portuguese *Empetrum album*. Very plentiful throughout the præsidium, in secondary thickets chiefly on a sandy soil, flowering from October to January; at Luxillo, fl. and fr. Jan. 1857. No. **5729**. An undershrub or rather a herb at length becoming woody at the base; root thick, woody, very hard: stems few, sometimes erect or oblique but mostly ascending or even prostrate; flowers very elegant, violet-rosy or very rarely white; berries edible, pale violet in colour, pleasantly acid-sweet. In rather dry bushy places between Pungo Andongo and Candumba, plentiful; fl. Feb. and May 1857. No. **5620**. A suffruticose herb, 5 to 6 ft. high; stems numerous, erect, branched; branches somewhat erect; flowers brilliantly white; fruit baccate, of a dirty violet colour; drupels monopyrenous. In rocky thickets to the south of the præsidium and at the river Casalalé plentiful; fl. and fr. end of April 1857. No. **5691**. Fruit edible, like a strawberry; in fl. No. **5693**. An erect or decumbent herb, almost suffrutescent at the base; root woody, perennial; flowers rosy-purple or violet in colour; fruit baccate violet-coloured, pleasantly acidulous, edible. At Candumba; fr. March 1857. Apparently this species. Coll. Carp. 842.

Huilla.—Flowers white. In the poorer thickets near Lopollo; fl. and fr. end of Nov. 1859. No. **5755**. An undershrub, $1\frac{1}{2}$ to 3 ft. high, with white flowers. In the Monino thickets near Humpata; fl. and fr. Jan. and April 1860. No. **5761**.

This as here treated is a very variable species; the Pungo Andongo specimens include the *Lantana* mentioned by Welwitsch in Apontam. p. 591. n. 111.

3. **L. subtracta** Hiern, sp. n.

A perennial herb; rootstock woody; stems several, elongate-sarmentose, 1 to $1\frac{1}{2}$ ft. long, scabrid-hispid with stiff whitish spreading hairs, rather slender; leaves opposite, ovate elliptical or obovate, mostly spreading, rigidly herbaceous, more or less obtuse at the apex, narrowed towards the base, minutely glandular, more or less scabrid, yellowish green on both faces in the dry state, crenate-serrate except near the base, 1 to $1\frac{1}{2}$ in. long by $\frac{1}{3}$ to $\frac{2}{3}$ in. broad, the uppermost ones smaller; venation slender, slightly depressed on the upper face; the middle internodes $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long; flower-heads solitary in the lower axils, ovoid or hemispherical, $\frac{1}{3}$ to $\frac{1}{2}$ in. long, bracteate at the base and between the flowers; bracts elliptical-ovate or the lower ones oval, herbaceous, minutely glandular, hispidulous on the back, shortly ciliate, acute at the apex or the lower ones obtuse, mostly entire, narrowed at the sessile base, suberect or rather spreading, the middle ones about $\frac{1}{4}$ in. long, the upper ones rather smaller, the lower ones rather larger; nerves slender; peduncles of the heads $\frac{1}{4}$ to $\frac{1}{3}$ in. long, hispid; flowers numerous, sessile or nearly so, about $\frac{1}{5}$ in. long; calyx about $\frac{1}{20}$ in. long, minutely glandular, hairy, compressed, shortly tubular, somewhat keeled but not winged on the two edges; corolla about $\frac{1}{6}$ in. long, shortly hairy outside, white, tubular; the tube a little bent below the middle, slightly dilated about the bend; the limb deeply obtusely and unequally 4-lobed; fruit ovoid, somewhat compressed, 2-celled, about $\frac{1}{10}$ in. long; endocarp thinly crustaceous.

Huilla.—In hilly places near Lopollo among shrubs, rather rare, fl. and fr. Nov. 1859 ; also in thickets flooded in the rainy season, in the same neighbourhood ; fl. and fr. Jan. 1860. No. **5756**.

4. **L. viburnoides** Vahl, Symb. Bot. i. p. 45 (1790).

Charachera viburnoides Forsk. Fl. Ægypt.-Arab. p. 116 (1775).

Huilla.—An aromatic undershrub, 1½ ft. high or more, with white flowers. In the Lopollo thickets ; fl. Dec. 1859 and Jan. 1860. No. **5762**. Flowers white. In the Monino forests among tall herbs ; fl. end of March 1860. No. **5751**.

Our specimens are not in fruit, and therefore their determination is doubtful.

2. **LIPPIA** Houst., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1142.

1. **L. nodiflora** Mich. Fl. Bor. Amer. ii. p. 15 (1803).

Verbena nodiflora L. Sp. Pl. edit. 1, p. 20 (1753). *Phyla nodiflora* E. L. Greene, Pittonia iv. p. 46 (1899).

Loanda.—A bright green, prostrate-rooting herb ; leaves firm and somewhat rigidly fleshy ; flowers purple. In damp pastures near Quicuxe, not plentiful ; fl. 10 June 1858. Nos. **5638**, **5717**.

Barra do Bengo.—An extensively creeping, bright green herblet, with somewhat fleshy leaves and whitish-rosy flowers. About the lake of Quisequele near Quifandongo, plentiful ; fl. Dec. 1853. No. **5642**.

Pungo Andongo.—Flowers violet-purple. At Salina da Dungo ; fl. and fr. end of March 1857. No. **5694**.

Mossamedes.—Flowers purple. In damp sandy places at the lakes of the river Caroco, abundant, in company with *Heleochloa schoenoides* Host (Welw. herb. no. 2622) ; fl. 3 Sept. 1859. No. **5748**.

2. **L. adoënsis** Hochst. in Schimp. Pl. Abyss. ii. n. 1079 (1842) ; Schauer in DC. Prodr. xi. p. 578 (1847) ; A. Rich. Fl. Abyss. ii. p. 167 (1851).

Lantana abyssinica Otto & Dietr. Allg. Gartenzeit. ix. p. 379 (1841). *Lippia grandifolia* Hochst., *l.c.*, ii. n. 734 ; A. Rich., *l.c.*

Golungo Alto.—Between Trombeta and Cabondo ; in late fr. Sept. 1854. No. **5741**.

Cazengo.—An erect herb, 3 to 4 ft. high, with the aspect somewhat of a *Sparganophorus*. In the drier bushy places between the river Luinha and Mount Muxaûla ; in young fl. June 1855. No. **5627**.

Ambaca.—An undershrub, 1½ to 2 ft. high ; stems ascending, angular ; leaves coriaceous, very rough ; flowers small, whitish. In bushy places near Halo, sparingly ; fl. Oct. 1856. Differs from the type of the species by its ascending and not strictly erect habit. No. **5732**.

Pungo Andongo.—An erect undershrub. In rocky places to the south of the præsidium ; in fl.-bud middle of April 1857. Nos. **5690** *partly*, **5667** *partly*.

Var. **multicaulis**.

An erect undershrub, 3 to 7 ft. high, more or less aromatic ; rootstock woody ; stems numerous, angular, furrowed, branched above ; branchlets opposite or ternate, erect-patent, hispidulous-pubescent ; leaves opposite or ternate, lanceolate or narrowly elliptical, more or less narrowed at both ends, scabrid and hispidulous with impressed venation above, thinly pubescent or hispidulous beneath, crenulate, 2 to 4½ in. long by ½ to 1¼ in. broad ;

petiole $\frac{1}{8}$ to $\frac{1}{2}$ in. long; flowers small, capitate; heads subhemispherical in flower, $\frac{1}{2}$ in. in diameter, densely bracteate, ovoid-oblong in fruit; bracts ovate-oblong, imbricate, shortly pubescent on the back, minutely glandular, longitudinally lined, about $\frac{1}{4}$ in. long; calyx scarcely or about $\frac{1}{20}$ in. long, hairy; corolla $\frac{1}{8}$ to $\frac{1}{6}$ in. long, brilliantly white or whitish; limb small, $\frac{1}{16}$ in. in diameter; style $\frac{1}{16}$ in. long; fruit dry.

Ambaca.—In the more elevated bushy mountainous places about Puri-Cacarambola; fl. and fr. Oct. 1856. No. **5733**.

Pungo Andongo.—In bushy rocky places to the south of the præsidium, plentiful; fl. and fr. middle of April 1857. Bunda name "Mangue." Nos. **5690** *partly*, **5667** *partly*.

3. **L. asperifolia** Marthe, Cat. Pl. Jard. Med. Paris, p. 67 (1801). *Verbena globiflora* L'Herit. Stirp. Nov. p. 23, t. 12 (1784). *Lantana lavandulacea* Jacq. Pl. Rar. Schoenbr. iii. p. 59, t. 361 (1798).

Bumbo.—A strongly aromatic undershrub, 4 to 6 ft. high, with white flowers. In thickets near Bumbo, very plentiful; fl. and fr. Oct. 1839. No. **5749**.

Huilla.—Flowers white. In hilly thickets on the right bank of the Lopollo river; fl. and fr. Dec. 1859 and Feb. 1860. No. **5750**.

I have not seen the type of this species; our specimens bear some resemblance to *L. adoënsis* Hochst., but the heads of flowers are smaller.

3. **VALERIANOIDES** Boerh. ex Medic. Phil. Bot. i. p. 177 (1789). *Abena* Neck. Elem. Bot. i. p. 296 (1790). *Stachytarpheta* Vahl, Enum. i. p. 205 (1804); Benth. & Hook. f. Gen. Pl. ii. p. 1145.

1. **V. mutabilis** O. Kuntze, Rev. Gen. Pl. ii. p. 510 (1891), (*Valerianodes*).

Stachytarpheta mutabilis Vahl, *l.c.*, p. 209. *Stachytarpha elegans* Welw. Apontam. p. 588. n. 56 (1859).

Loanda.—At Bemposta; fl. Dec. 1858. Nos. **5737**, **5649**, **5716**.

Pungo Andongo.—An undershrub, 3 ft. high, much branched from the base; branches divaricate-ascending; flowers of a deep violet colour. In secondary thickets near Quitage, between Pungo Andongo and Cassange, rather rare; fl. beginning of March 1857. No. **5631**. An undershrub, 2 to 3 ft. high, fastigiately branched at the apex; flowers violet or white or variegated with purple. In thickets near Quitage; fl. March 1857. Coll. Carp. 840.

Huilla.—At Catumba; fl. May 1860. No. **5764**.

Welwitsch in Apontam., *l.c.*, states that this is a very rare plant and was found by him only in one spot; but in a ms. note he reported it as plentiful in another locality. It is perhaps the *Stachytarpheta* mentioned by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 250, n. 130, as an ornamental undershrub, 3 to 4 ft. high, with large white handsome flowers, and as growing in damp fields in the Loanda country, where it is rather rare and flowers from November to February.

2. **V. jamaicensis** O. Kuntze, *l.c.*, p. 509 (*Valerianodes jamaicense*).

Verbena jamaicensis L. Sp. Pl., edit. 1, p. 19 (1753). *Verb. indica* L. Syst. Nat., edit. 10, ii. p. 85 (1759); Jacq. Obs. Bot. iv.

p. 7, tab. 86 (1771). *Verb. angustifolia* Mill. Dict. ed. 8, n. 15 (1768). *Stachytarpheta angustifolia*, *S. indica*, and *S. jamaicensis* Vahl, Enum. Pl. i. pp. 205, 206 (1804). *S. indica* Ficalho, Pl. Uteis, p. 240 (1884).

Loanda.—In damp places at the edges of ponds near Quicuxe, and by Represa do Manoel Pereira van Hunnen, rather rare ; fl. beginning of July 1854. No. **5652**.

Icolo e Bengo.—An annual, erect, bright green herb, branched from the base ; leaves membranous, rather glossy ; flowering spikes straight, very slender, elongated, usually more than 6 in. long ; flowers violet-purple, rarely whitish-violet in colour, scarcely larger than those of *Verbena officinalis* L. In swampy places about Lagoa da Funda, not uncommon ; also near Imbondeiro dos Lobos ; fl. beginning of Sept. 1859. No. **5640**.

According to a note of Welwitsch, this species is used in Loanda, where it is plentiful, as a remedy in cases of dysentery, in the same way as it is in tropical America ; the native name is "Cachinde ca menha."

4. **DURANTA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1150.

1. **D. erecta** L. Sp. Pl., edit. 1, p. 637 (1753).

D. repens L., *l.c.* *D. plumieri* L. Sp. Pl., edit. 2, p. 888 (1762).

Huilla.—A much-branched shrub, 5 to 6 ft. high, with blue flowers. In shrubby places near Lopollo, in company with *Psiadia arabica* Jaub. & Spach (Welw. herb. no. 3914), *Jasminum microphyllum* Baker (Welw. herb. no. 932), and *Siphonanthus dumalis* (Welw. herb. no. 5763) ; fl. and fr. Nov. 1859. No. **5760**. An arborescent spinescent shrub, with bright blue flowers. In thickets near Lopollo, plentiful ; fl. and fr. May 1860. Coll. Carp. 91.

5. **PREMNA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1152.

1. **P. angolensis** Gürke in Engl. Bot. Jahrb. xviii. p. 165 (22 Dec. 1893).

Golungo Alto.—Glabrescent except the puberulous inflorescence ; branches woody, subterete, somewhat pallid, striate, inconspicuously lenticellate ; branchlets somewhat angular, leafy ; leaves ternate, quaternate or opposite, roundly ovate, cuspidate obtuse or pointed at the apex, usually very obtuse or sub-truncate at the base, thinly coriaceous, entire and somewhat undulate on the margin, yellowish green on both faces, 3 to 5 in. long by 2 to 3 in. broad ; lateral veins about 4 or 5 on each side of the midrib, slender ; petioles 1 to 3 in. long ; inflorescence terminal, subglobose, about 3 in. in diameter, divaricately branched, densely many-flowered ; common peduncle scarcely an inch long ; ultimate pedicels very short, sub-obsolete ; bracteoles minute ; flowers about $\frac{1}{8}$ in. long, crowded ; calyx about $\frac{1}{20}$ in. long, hemispherical-campanulate, truncate or scarcely lobed ; corolla shortly tubular ; the tube about $\frac{1}{20}$ in. long by $\frac{1}{15}$ in. broad ; the limb oblique, 4-lobed, somewhat spreading ; the lobes rounded ; the throat hairy ; stamens 4, subdidynamous, scarcely exserted, inserted on the corolla-throat, glabrous ; style $\frac{1}{12}$ to $\frac{1}{10}$ in. long, scarcely exserted, glabrous, straight or a little curved, notched at the apex ; ovary depressed-spheroidal, marked with two furrows, nearly glabrous, with some small scaly hairs or minute glands. At Undelle ; fl. April 1856. Called "Mungongo." No. **5628**. A tree,

20 to 35 ft. high, 1 to 2½ ft. in diameter at the base, where it usually divides into 3 or 4 stout tortuous trunks one or two of which are straighter and stricter, with the habit of *Catalpa bignonioides* Walt., glabrous throughout except the slightly puberulous inflorescence; wood light, durable and resonant, adapted for the manufacture of various musical instruments, as for instance the marimbas, and for drumsticks; branches pale, lenticellate, subterete; branchlets obtusely angular, furrowed; leaves ternate or opposite, broadly ovate or oval, usually cuspidate at the apex and wedgeshaped at the base, papery, somewhat glossy, pale yellowish green (in the dry state), entire or undulate-subrepand on the very narrowly revolute margin, 3½ to 5 in. long by 2 to 3½ in. broad; lateral veins about 6 or 7 on each side of the midrib; petioles 1½ to 3¼ in. long, rigid, very brittle at the base where they are jointed to the branchlets; panicles of the numerous white flowers terminal, very large, pyramidal or thyrsoid, divaricately branched, about a foot long and nearly as broad; common peduncle about 3 in. long, deeply furrowed, robust; ultimate pedicels very short; bracteoles subulate or minute; flowers $\frac{1}{10}$ in. long; calyx campanulate-oblong, $\frac{1}{15}$ in. long, subtruncate, indistinctly bilobed; corolla-tube $\frac{1}{20}$ to $\frac{1}{16}$ in. long; limb 4-lobed, somewhat oblique; throat hairy; stamens 4, subdidynamous, inserted on the corolla-throat, glabrous, scarcely exserted; style $\frac{1}{10}$ in. long, glabrous, with two short spreading branches at the apex; fruit of a fine bluish colour, as large as a juniper berry. In forests and palm groves in the Sobatos of Calanga, Quilombo, Bango, etc., plentiful; fl. Jan., fr. March 1855. Nos. **5639, 5724.** At Sange; fr. March 1856. COLL. CARP. 843.

It occurs also in the districts of Cazengo and Ambaca. *See* Welw. Synopse Explic. p. 15, n. 36 (1862). The wood is also used for internal doors, benches, etc. The local name is "Paó Mungôngue" or "Mugongue."

2. **P. polita** Hiern, sp. n.

A shrub, 4 to 6 ft. high; branches elongated, puberulous or nearly glabrate, lenticellate, subterete, subsarmentose, leafy; branchlets patent, often abbreviated or brachiate; leaves oval or ovate, acuminate and apiculate at the apex, obtuse or rounded at the 3- to 5-nerved base, thinly coriaceous, minutely glandular, deep green above, paler beneath, nearly glabrous or slightly puberulous, somewhat glossy, entire or subrepand on the narrowly revolute margin, opposite, spreading, 2 to 3 in. long by $\frac{2}{3}$ to 1 in. broad or rather larger; venation rather slender; petioles $\frac{3}{8}$ to $\frac{5}{8}$ in. long, puberulous; inflorescence terminal, umbellate-corymbose, 2 to 3 in. in diameter, shortly pedunculate, puberulous, divaricately branched, rather dense; ultimate pedicels short, bracteolate; primary or sub-primary branches of the cymes umbellate, bracteate at the base; bracts sublinear, about $\frac{1}{4}$ in. long; bracteoles smaller; flowers numerous, about $\frac{1}{5}$ in. long; calyx $\frac{1}{12}$ in. long, campanulate, glandular-puberulous, shortly and unequally 5-lobed, the teeth obtuse; corolla shortly tubular glandular-puberulous outside, shaggy inside about the throat, the lobes rather small; stamens sub-didynamous, glabrous; filaments short, inserted at the corolla-throat; style slender, shortly exserted, with 2 short spreading branches; fruit spheroidal, rounded at the apex, minutely glandular-puberulous, marked

with 4 shallow longitudinal and other furrows, $\frac{1}{3}$ to $\frac{1}{4}$ in. long, $\frac{1}{7}$ to $\frac{1}{6}$ in. broad, received at the base into the persistent not lengthened calyx; endocarp crustaceous; seeds (in one case) 2.

Golungo Alto.—In the more elevated thickets among the Alto Queta mountains, very rare; fl. Dec. 1855. No. **5656**; fr. July 1855. No. **5725**.

Aspect somewhat of *Siphonanthus glabra*.

3. **P. colorata** Hiern, sp. n.

A tree, 20 to 25 ft. high in the primitive forests or in secondary woods 12 to 15 ft.; trunk slender, straight, 3 to 4 in. in diameter at the base, with a whitish bark; head widely spread; branches opposite, patent; branchlets spreading nearly horizontally, more or less clothed with tawny short stellate tomentose hairs, inconspicuously lenticellate; leaves opposite, oval or nearly so, acuminate at the apex, obtuse or obliquely narrowed at the base, papery or membranous, entire or nearly so, minutely glandular, pale green and more or less clothed with tawny stellate hairs along the midrib and principal veins above, subglaucescent and comparatively glabrescent beneath, 3 to 6 in. long by $1\frac{1}{2}$ to 3 in. broad; lateral veins about 6 on each side of the midrib, slender; petioles $\frac{1}{3}$ to 1 in. long, tomentellous; flowers about $\frac{3}{16}$ in. long, as well as the whole inflorescence pale-sulphur in colour or the flowers whitish violet, arranged in terminal obtusely pyramidal pubescent patently branched bracteate many-flowered panicles of 3 to 6 in. long; common peduncles ranging up to 2 in. long, tawny-tomentose; bracts and bracteoles narrow, the lower ones $\frac{1}{4}$ to $\frac{3}{8}$ in. long, the upper ones rather shorter; ultimate pedicels $\frac{1}{8}$ in. long or shorter, tawny-tomentose; calyx campanulate or subhemispherical, somewhat compressed, $\frac{1}{12}$ to $\frac{1}{20}$ in. long, persistent, shortly 5-lobed, tomentose; the lobes rounded or obtuse, equal or subequal; corolla tubular, about $\frac{1}{5}$ to $\frac{1}{4}$ in. long, glandular outside, quickly deciduous; the tube $\frac{1}{6}$ to $\frac{1}{5}$ in. long, $\frac{1}{24}$ to $\frac{1}{16}$ in. broad, subgibbous about the middle; the limb shortly bilabiate; the upper lip 3-lobed, with reflected lobes; the lower lip directed forwards, deeply emarginate; stamens 4, didynamous, all fertile, glabrous; the filaments slender, inserted below the middle of the corolla, exserted by $\frac{1}{14}$ to $\frac{1}{12}$ in.; anthers small, shorter than broad, 2-celled, dehiscing laterally; style $\frac{1}{4}$ in. long, glabrous, terminal, exserted, bilobed at the apex, the branched stigmatose and capitellate at the apex; ovary $\frac{1}{24}$ in. long, subglobose, entire, superior, glandular above, 4-celled; ovules solitary; young fruit glabrate, unlobed, $\frac{1}{8}$ in. broad.

Golungo Alto.—Flowers whitish violet. In the more elevated primitive forest of Cungulungulo; fl. Feb. 1855. No. **5663**.

Pungo Andongo.—Flowers sulphur-coloured. In the deep valleys among the gigantic rocks of the præsidium at Casongue; fl. Nov. 1856. No. **5730**. Flowers straw-coloured. In the wooded parts of Barranco de Songue, sparingly; fl. and young fr. Feb. 1857. No. **5736**. Flowers pale sulphur in colour. In shaded woods at the base of the

gigantic rocks to the south-west of the præsidium, near Pedra Sonde ; fl. and young fr. 3 Jan. 1857. No. **5735**. In fl. No. **5677**.

The following two Nos. possibly belong to *Premna*, but I cannot identify them with any described species ; they are apparently conspecific :—

Golungo Alto.—Shrubby ; branches spreading, ascending, glabrate or obsoletely puberulous, cinereous ; branchlets angular, beset with short close pallid stellate hairs ; leaves ternate or opposite, obovate, obtuse and apiculate at the apex, wedgeshaped at the base, thinly coriaceous, dark green and nearly glabrate above, paler and beset with short stellate pale hairs beneath, 2 to 3 in. long by $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad, entire or subrepand on the very narrowly revolute margin, exstipulate, lateral veins about 6 on each side, slender ; petioles $\frac{1}{3}$ to $\frac{2}{3}$ in. long, hairy at least above ; inflorescence terminal and subterminal, branched, tomentose with pale stellate hairs, bracteate ; bracteoles narrow. Near Quilombo ; fl. not developed, Jan. 1855. No. **5637**.

Huilla.—A shrub, 4 ft. high ; leaves narrowly elliptical or obovate. In thickets near the Ivantâla lake, sporadic ; fl. not developed, end of Feb. 1860. No. **5754**.

6. **VITEX** Tournef., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1154.

1. **V. madiensis** Oliv. in Trans. Linn. Soc. xxix. p. 134. t. 131 (1875).

V. camporum Büttn. in Verh. Bot. Brandenb. xxxii. p. 35 (1890).

Golungo Alto.—In the primitive forest a small tree of 6 to 8 ft., but in secondary thickets a shrub of $1\frac{1}{2}$ to 3 ft. sometimes somewhat erect sometimes almost decumbent ; leaves sometimes simple sometimes trifoliolate ; infructescence axillary, cymose ; common peduncle $1\frac{2}{3}$ in. long, puberulous ; fruit glabrescent, $\frac{1}{2}$ in. in diameter ; fruiting calyx hemispherical, sub-entire. In wooded sunny places and in rather dry open thickets in Sobata de Mussengue, at Menha-Lula ; fr. May 1855. No. **5713**. In fl. No. **5728**.

Var. **parvifolia**.

Leaves trifoliolate or simple ; the middle or only leaflet $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long by 1 to $1\frac{3}{4}$ in. broad ; the lateral ones smaller.

Golungo Alto.—A shrub of 6 to 8 ft., perhaps in the primitive forest a tree ; flowers violet-blue ; fruit like a grape in shape, almost as large as that of *V. Cienkowskii* (Welw. herb. nn. 5633, 5645). In the drier secondary thickets of Sobato de Mussengue ; fl. Jan. 1856. No. **5636**.

V. simplicifolia Oliv., *l.c.*, p. 133. t. 130, non C.B. Cl., is probably the same species, since our specimens include both simple and trifoliolate leaves and both longer and shorter peduncles.

2. **V. Mechowii** Gürke in Engl. Bot. Jahrb. xviii. p. 167 (22 Dec. 1893).

V. flavescens Rolfe in Bot. Soc. Brot. xi. p. 87 (1894).

Pungo Andongo.—A dwarf shrub, 2 to $3\frac{1}{2}$ ft. high, softly shaggy-tomentose throughout ; branches patent ; flowers violet-blue, or reddish purple, comparatively large. In bushy secondary forests near Cazella, between Zamba and Pungo Andongo ; fl. and fr. Oct. 1856. No. **5731**. A shrub, 2 to 4 ft. high, divaricately branched ; flowers lilac like those of rosemary. In sandy thickets between Cazella and Luxillo, sparingly ; fl. 18 Oct. 1856. No. **5697**.

The following perhaps belongs here :—

Pungo Andongo.—A patently branched, bushy tree, 10 ft. high, with trifoliolate leaves and violet-coloured flowers ; fruit obovoid, $1\frac{1}{4}$ in. long, with perfected seeds. At Candamba by the river Cuanza ; fr. March 1857. Coll. Carp. 847.

3. **V. angolensis** Gürke, *l.c.*

Huilla.—At Mumpulla, fl. Oct. 1859 ; fr. Feb. 1860. No. **5758**. Flowers violet in colour. In the Empalanca thickets, sporadic ; fl. Jan. 1860. No. **5757**.

4. **V. Welwitschii** Gürke, *l.c.*, p. 166.

Golungo Alto.—An elegant, densely leafy tree, 12 to 25 ft. high or in the primitive forest probably taller ; leaves evergreen ; flower violet in colour ; drupes (not quite ripe) almost globose, in shape and size like those of a Queen Claude plum, juicy, at first greenish yellow, afterwards dusky purple. In secondary woods close to the declivities of the river Cuango, at the foot of the Queta mountains ; fl. June 1855 and March 1856 ; young fr. Aug. 1855. No. **5644**.

This is perhaps the plant referred to by Welwitsch, Apontam. p. 585, n. 15, as a scarcely described species of *Vitex* or allied genus, occurring in the Golungo Alto primitive forests, and being a beautiful tree with widely spread crown, palmately 5- to 7-foliolate leaves, violet-coloured flowers, and large edible fruit prettily purple in the living state and greedily searched for by the negroes and wild birds.

5. **V. cuspidata** Hiern, sp.n.

A tall tree, in old age leafy only at the top ; timber excellent ; branches spreading, minutely squamulose, smooth ; branchlets opposite, softly tomentellous, patent, tawny-shaggy at the tips ; leaves opposite, spreading, digitately 3- to 5-foliolate ; common petioles 2 to 4 in. long, slender, more or less tomentellous ; central leaflet obovate, acutely cuspidate at the apex, wedgeshaped at the shortly petiolulate base, thinly coriaceous, deep green rather glossy and more or less furnished with scattered minute tubercles or scales above, subferruginous and softly tomentellous especially along the midrib and spreading lateral veins beneath, entire, $2\frac{1}{2}$ to $4\frac{1}{2}$ in. long by 1 to $1\frac{3}{4}$ in. broad ; the lateral leaflets smaller ; infructescence axillary, lax, divaricately branched, equalling or exceeding the leaves ; common peduncle 3 to $4\frac{1}{2}$ in. long, rigid, rather slender, tomentellous or obsoletely so ; bracteoles narrow, deciduous, hairy ; unripe fruit ovoid, obtuse, subglabrate, $\frac{1}{2}$ in. long, $\frac{1}{3}$ in. broad, $\frac{1}{4}$ in. thick ; fruiting calyx subhemispherical, shortly puberulous or obsoletely so, $\frac{1}{5}$ in. long, the lobes unequal, shallow.

Golungo Alto.—In the more elevated forests among the mountains of Serra de Alto Queta ; young fr. April 1856. No. **5665** and Coll. Carp. 849.

The foliage in shape somewhat resembles that of *V. Welwitschii*.

6. **V. Guerkeana.**

V. rufescens Gürke, *l.c.*, p. 169 ; non A. Juss. in Ann. Mus. Paris, vii. p. 77 (1806).

Golungo Alto.—A tree, 25 to 35 ft. high ; head widely spreading,

very elegant ; branches spreading, the lower ones brachiate-ascending. In the primitive forests of mount Cungulungulo, rather rare, not opening its flowers for a whole year ; fl.-bud Feb. 1855. No. **5632**.

The Fungus n. 42 at Camilungo in June 1855 grew on the decayed trunklets of a *Vitex*, perhaps this species.

The following two Nos. should be compared with this species ; the second one should also be compared with *V. rivularis* Gürke ms. in Pl. Zenker. n. 1333 from the Cameroons :—

Golungo Alto.—A young tree, 5 ft. high, resembling a horse-chestnut in habit. In the Queta forests, sparingly : without fl. or fr. Oct. 1855. No. **5654**. A tall tree, almost like a horse-chestnut in habit, differing from the last No. by its leaflets being acutely toothed at the apex and without ferruginous pubescence. In the more elevated forests among the Queta mountains ; without fl. or fr. middle of Oct. 1855. No. **5712**.

7. **V. Cienkowskii** Kotschy & Peyr. Pl. Tinn. p. 27. n. 42, t. 12 (1867).

V. paludosa Vatke in Linnæa, xliii. p. 534 (1882).

Golungo Alto.—An extensive tree ; head very broad, depressed-hemispherical ; flowers violet in colour ; fl. Jan. 1855 and May 1856. No. **5645**. A vast tree, 30 to 50 ft. high ; timber whitish, good ; head widely spreading ; branches patent, somewhat tortuous ; leaves hard coriaceous, very rigid, glossy, subglaucous beneath ; flowers lilac like those of rosemary ; fruit like a grape in shape, as large as a moderate-sized pigeon's egg. In deep valleys among the Queta mountains, close to streams ; fl. Dec. 1855 ; fr. March 1856. No. **5633**. A densely leafy tree, 12 ft. high, with somewhat erect branches and violet-coloured flowers. At Arimo de Mariano ; fr. beginning of July 1856. Coll. Carp. 844. In forests near Sange, plentiful ; fr. July 1857. Coll. Carp. 845. A handsome, evergreen tree ; leaves 5-foliolate ; flowers pale violet in colour ; fruit drupaceous blackish purple, with a large seed. In the primitive forests of Undelle ; fr. Aug. 1857. Coll. Carp. 846.

Lichens nn. 291, 313, grew on the leaves, also *Unona lucidula* Oliv. (Welw. herb. no. 758) and *Angræcum Galeandræ* Reichenb. f. (Welw. herb. no. 658) grew on this tree. The Bunda name is "Muxillo-xillo" or "Muxillo-xyllo ;" see Welw. Apontam. p. 550 under no. 95, and Ficalho, Pl. Uteis, p. 241 (1884). The branches of the large trees are pendulous, and the flesh which envelopes the stone in the fruit is very oily. No. **5746**, also from Golungo Alto, in fl.-bud and young fr., with leaflets narrowly elliptical or obovate wedgeshaped at base and ranging up to 8½ in. long by 3½ in. broad, and with petioles ranging up to 6 in. long, perhaps belongs here.

It was probably this tree, growing in the district of Pungo Andongo, the heads of which were covered with the parasite *Cassytha filiformis* L. (Welw. herb. no. 6428). It may also be the "Mucolocolo," a very lofty tree with 5-foliolate leaves, racemose nodding flowers, and fruits as large as oranges containing oily seeds ; plentiful in Golungo Alto, chiefly at the foot of meadows.

8. **V. Doniana** Sweet, Hort. Brit., edit. 1, p. 323 (1827).

V. umbrosa Sabine in Trans. Hort. Soc. v. p. 455 (1824), non Swartz (1788).

Golungo Alto.—A small tree of 8 to 12 ft., or in secondary thickets

a shrublet of 2 ft. freely flowering and fruiting; flowers violet-bluish. On rather dry bushy slopes and in reed-beds among the Queta mountains; fl. May 1855. Nos. **5634**, **5635**. Roadway leading to Cubata de Tindandolo; fl. April and May 1855. A form with the leaflets softly and shortly pilose beneath. No. **5695**.

Var. ? **pumila**.

Pungo Andongo.—Pedras de Guinga; in fl. and young fr. No. **5668**. A small subglabrous shrub, $1\frac{1}{2}$ to 3 ft. high; stems numerous, simple, erect; leaves 3- to 5-foliolate, coriaceous; flowers becoming violet in colour. In wooded thickets near Pedra de Guinga, rather rare; fl. March 1857. No. **5747**.

The type specimen of the above species in the National Herbarium is too imperfect to warrant certainty of identification with our specimens; the Pungo Andongo plants belong perhaps to a distinct species from those of Golungo Alto.

9. **V. huillensis** Hiern, sp. n.

Closely branched; branchlets ascending, obtusely angular, somewhat tawny or ashy, more or less tomentellous with pallid short soft hairs; leaves mostly ternate, digitately 3- to 5-foliolate; common petiole 1 to 2 in. long, pilose-tomentellous; central leaflet obovate, often narrowly so, shortly acuminate pointed or rounded at the apex, wedgeshaped or obtuse at the base, thinly and firmly coriaceous, yellowish green and somewhat scabrid above with very short deciduous hairs arising from minutely tubercular persistent bases, pallid and softly and shortly pilosulous beneath, entire, 2 to $3\frac{1}{2}$ in. long by $1\frac{1}{4}$ to $1\frac{3}{4}$ in. broad, shortly petiolulate; lateral veins about 10 on each side of the midrib, slender, midrib prominent beneath; lateral leaflets smaller; inflorescence axillary, softly pilose-tomentose with pallid hairs, densely cymose, shorter and narrower than the leaves; common peduncle $\frac{3}{4}$ to $1\frac{1}{2}$ in. long; bracts very narrow, subulate, $\frac{1}{6}$ in. long or shorter, deciduous; ultimate pedicels very short; flowers numerous, $\frac{1}{4}$ to $\frac{1}{3}$ in. long; calyx hairy outside, glabrous inside, obliquely campanulate in flower, somewhat enlarged and hemispherical in young fruit, shortly 5-lobed; the lobes subdeltoid, pointed, somewhat unequal; corolla-tube $\frac{1}{8}$ to $\frac{1}{5}$ in. long, above hairy outside, nearly glabrous below both inside and out, oblique at the top; the limb unequally 5-partite; the lowest lobe rounded, $\frac{1}{10}$ in. long, suberect or spreading, hairy outside near the base, glabrous above and inside; the other lobes smaller; the throat glabrous or nearly so; stamens 4, subdidynamous; filaments pilosulous, inserted about the middle of the corolla-tube; anthers short, just exserted; style $\frac{1}{5}$ in. long, equalling the longer stamens, slender, glabrous or microscopically glandular, bifid at the top; ovary small, 4-celled, as glabrous as the style.

Huilla.—In the wooded parts of the Catumba country among tall bushes; fl. and young fr. Dec. 1859. No. **5759**.

10. **V. andongensis** Baker & Hiern, sp. n.

Branches woody, tawny, scarcely tetragonal, pilose and leafy at the apex; glabrate below; leaves opposite, digitate, quinque-

foliolate; central leaflet broadly elliptical oval or somewhat ovate, shortly and acutely acuminate or only apiculate at the apex, somewhat narrowed or obtuse at the base, thinly coriaceous, entire, yellowish green (in the dry state) and nearly glabrous above, pallid and shortly tomentellous beneath, $2\frac{1}{2}$ to $6\frac{1}{2}$ in. long, by $1\frac{1}{2}$ to $3\frac{1}{4}$ in. broad; lateral veins 10 to 20, slender, spreading-ascending; lateral leaflets rather smaller; common petiole 4 to 8 in. long, robust, slightly or obsoletely tomentellous; central petiolule $\frac{3}{4}$ to $1\frac{3}{4}$ in. long, somewhat or obsoletely tomentellous; lateral petiolules rather shorter; inflorescence axillary, divaricately and dichotomously cymose, sometimes with a single shortly pedicellate flower in the forks, shorter than the leaves, shortly tomentellous; peduncle $1\frac{1}{4}$ to 4 in. long; ultimate pedicels mostly very short; bracts narrow, tomentose beneath, $\frac{3}{4}$ in. long or shorter, deciduous; flowers numerous, mostly crowded, about $\frac{1}{3}$ in. long, calyx $\frac{1}{8}$ in. long, cup-shaped, subtruncate, scarcely or irregularly toothed, pallid and tomentellous outside, glabrous inside, somewhat increased in fruit; corolla about $\frac{1}{4}$ in. long; the tube obliquely funnel-shaped, $\frac{1}{6}$ in. long, glabrous below; the limb unequally 5-partite; the lobes obtuse and rounded at the apex, shortly tomentellous at the back, glabrous inside; the lowest lobe $\frac{1}{6}$ in. long, suberect; the other lobes shorter, spreading or reflected; the throat hairy; stamens 4, subdidynamous, inserted at the throat of the corolla, glabrous; anthers short, first exserted; young fruit egg-shaped, $\frac{1}{3}$ in. long, glabrate, received at the base in the cup of the persistent calyx.

Pungo Andongo.—In fl. and young fr. Dec. 1856. No. **5696.**

This species differs from *V. cuneata* Thonn. by the subtruncate calyx. The following perhaps belongs here:—

Pungo Andongo.—An erect little tree, 2 to 6 ft. high, divaricately branched at the apex. In thickets at Condo and Quisonde; fr. March 1857. Fruit obovoid-oblong, $\frac{1}{2}$ in. long or rather more. Called "Muxillo cafele." Coll. Carp. 848.

11. **V. oxycuspis** Baker in Fl. Trop. Afr. v. *ined.*

"A small tree, 15 to 20 ft. high; branchlets glabrous; leaves 3- to 5-foliate, membranous, green and glabrous on both sides; leaflets obovate-cuneate, irregularly crenate, with a large linear cusp, distinctly stalked; end one 6 to 8 in. long by less than half as broad; main petiole 2 to 3 in. long; cymes lax, long-peduncled, axillary; branchlets glabrous; flower-calyx campanulate, glabrous, $\frac{1}{12}$ in. long; teeth short, deltoid; corolla glabrous, three times the length of the calyx; fruit unknown."—Baker MS.

Golungo Alto.—A low bush, probably a young state of a tree; trunk erect; branches slender, glabrous, erect-spreading; leaves 5- to 3-foliolate, membranous, glabrous; leaflets narrowly elliptical, acuminate, coarsely serrate-dentate, somewhat shining, green above, subglaucous beneath, $1\frac{1}{2}$ to $4\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{8}$ in. broad; petiole $\frac{1}{2}$ in. long or less. In secondary woods in the Eastern Queta mountains; without fl. or fr. Feb. 1856. No. **5671.**

This species is founded on a specimen collected by Mann, n. 2243.

7. **SIPHONANTHUS** L. Gen. Pl. edit. 2, p. 526. n. 1020 (1742), & Sp. Pl., edit. 1, p. 109 (May 1753).

Volkameria L. Syst. Nat., edit. 1 (1735), & Sp. Pl., edit. 1, p. 637 (Aug. 1753). *Ovieda* L. Gen. Pl., edit. 1, p. 59. n. 170 (1737), & Sp. Pl., edit. 1, p. 637 (Aug. 1753). *Clerodendrum* L. Gen. Pl., edit. 1, p. 384. n. 517 (1737), & Sp. Pl., edit. 1, p. 637 (Aug. 1753); Benth. & Hook. f. Gen. Pl. ii. p. 1155 (*Clerodendron*).

1. **S. Welwitschii.**

Clerodendron Welwitschii Gürke in Engl. Bot. Jahrb. xviii. p. 174 (22 Dec. 1893).

Golungo Alto.—At Quibixe. Leaves ranging up to 11 in. long by 8½ in. broad; without fl. or fr. July 1855. No. **5687**. A shrub, climbing widely, bluntly spiny; leaves at the time of the flowering soft, deep herbaceous green, the adult ones at length rigid, thick, ashy; calyx and corolla (perhaps not yet fully expanded) herbaceous green; corolla sub-bilabiate, 5-cleft; stamens 4; style ascending; stigma somewhat bifid. In bushy hilly places near Sange, at Alto de Ciniterio; fl. middle of Sept. 1855, fr. beginning of Nov. No. **5739**. Petioles spinescent; flowers white, very pleasantly fragrant. In the dense thickets of declivities in Sobato da Bumba-Quibixe, sporadic; fl. end of Sept. 1855. No. **5648**. In fl. Nos. **5686**, **5745**. In fl.-bud. No. **5689**. Without fl. or fr. No. **5734**.

2. **S. sanguinea** Hiern, sp. n.

A climbing shrub, mostly leafless at the time of flowering, in its early stages an erect bush of 5 or 6 ft., at length scandent with one or two elongated branches; leaves opposite or ternate or rarely alternate, broadly ovate or sub-rotund, acuminate-apiculate at the apex, more or less and usually deeply cordate at the base, somewhat fleshy and thinly coriaceous, remotely toothed or repand, sparingly hispid-pilose above with stiff adpressed deciduous hairs arising from minutely bulbous persistent bases, rather paler and more densely clothed with softer hairs beneath, the adult leaves ranging up to 15 in. in length and breadth, 3- or 5-nerved at the base, those next the inflorescence smaller and subsessile; lateral veins rather few, alternate or subopposite, rather slender; petioles tomentellous or puberulous, striate, the adult ones ranging up to 9½ in. long; flowering spike terminal, dense, (including the flowers) about a foot long, blood-red purplish throughout except the white corollas; bracts oblanceolate or broader, pointed, ¾ in. long; flowers slightly fragrant; calyx ¾ to ⅞ in. long, puberulous, shortly ciliate, campanulate at the base; the limb deeply 5-cleft; the lobes erect, persistent, oblong-ovate, acute, ⅜ to ½ in. long, not enlarging as the fruit ripens; corolla tubular; the tube elongated, pilose outside, 5 to 6 in. long, slender, a little dilated at the base; the limb 1 to 1½ in. in diameter, 5-partite; the segments oval, equal, patent-reflected, rather obtuse, clothed outside with thin reddish hairs; stamens 4, inserted a little below the throat of the corolla, all far exserted; filaments didynamous, spirally twisted, subsecund; connective of the

anthers thick, dorsifixed; anther-cells distinct; ovary obovoid, deeply 4-sulcate, 4-celled; ovules solitary in each cell; carpels glabrous, shining; fruit about $\frac{1}{2}$ in. long; seeds pendulous.

Pungo Andongo.—In little woods at the base of the gigantic rocks at Cazella, sporadic; fl. middle of Jan. 1857. No. **5705**. At Catete, fl. Feb. 1857; also in wooded thickets near Quilange in the præsidium; fl. middle of April 1857. No. **5688**.

3. **S. conglobata.**

Clerodendron conglobatum Baker, ms. in Herb.

A climbing, pale green shrub, spiny in consequence of the base of the petioles at length becoming woody; branchlets pubescent with pale spreading jointed deciduous hairs; leaves irregularly oval or oblong, more or less cuspidate at the apex, nearly rounded or cordate at the base, entire, membranous, thinly hispid on both faces with adpressed stiff jointed hairs, 2 to 6 in. long by 1 to 3 in. broad; lateral veins about 6 on each side of the midrib, slender; petiole $\frac{3}{8}$ to $1\frac{1}{4}$ in. long, densely pubescent with spreading jointed hairs, often bent near the base, the upper part being deciduous and the lower part hardening; flowers white, densely crowded in hemispherical heads or abbreviated cymes terminating the branches and short lateral shoots; bracts elliptical, hairy, ciliate, veiny, acute, $\frac{1}{3}$ to $\frac{1}{2}$ in. long; bracteoles narrow; peduncles short; pedicels very short; calyx $\frac{1}{3}$ to $\frac{1}{2}$ in. long, deeply 5-lobed; the segments ovate, acute, ciliate, veiny; corolla-tube slender, thinly pubescent, about an inch long; the limb about $\frac{1}{2}$ in. in diameter; filaments exserted by $\frac{1}{2}$ to $\frac{7}{8}$ in., slender, curved, glabrous; style slender, glabrous, exserted by nearly an inch.

Pungo Andongo.—At the bottom of rather elevated rocks in dense thickets near Cabondo; fl. middle of Jan. 1857. No. **5629**.

On a specimen in the British Museum set there is a bilobed leaf, probably an accidental occurrence. The species was collected by Capello, n. 121, between Caconda and Bihé, where it is called "Tandabale."

4. **S. stricta.**

Clerodendron strictum Baker ms. in Herb.

An undershrub, $1\frac{1}{2}$ to 2 ft. high; rootstock woody, polycephalous; stem erect, simple at least above, more or less pubescent with very short papilliform hairs intermixed with spreading jointed less short hairs, pallid, leafy, straight; leaves opposite or nearly so, erect-patent, oval or obovate-oblong, pointed or subacuminate at the apex, obtusely narrowed or nearly rounded at the tri-nerved base, herbaceous-membranous, green and hispidulous with depressed venation above, somewhat scabrid pale green and with raised venation beneath, $3\frac{1}{2}$ to 6 in. long by $1\frac{1}{3}$ to $2\frac{1}{3}$ in. broad; lateral nerves about 6 on each side of the midrib, conspicuous and hispid beneath; tertiary veins clearly marked and hispid beneath; petiole $\frac{1}{3}$ to $\frac{3}{5}$ in. long, hispid with short curving pale hairs; flowers white, on very short pedicels, crowded many together in terminal subsessile bracteate sub-capitate cymes;

bracts varying from ovate or obovate to narrowly elliptical, very acute, hairy at the back, ciliate, $\frac{1}{2}$ to 1 in. long, veiny; calyx $\frac{3}{4}$ in. long, deeply 5- or 4-lobed, the lobes ovate, very acute, resembling the bracts in substance and hairiness; corolla-tube slender, hairy outside, about 2 in. long or rather more; the limb about $\frac{1}{2}$ in. in diameter; the lobes 5, obtuse, imbricate in æstivation; stamens didynamous; filaments spiral in æstivation, in flower straight and exserted by $\frac{3}{4}$ or 1 in., nearly glabrous, slender; style exserted by more than an inch, nearly glabrous, slender.

Pungo Andongo.—In secondary wooded thickets by the river Caghuy between Caghuy and the river Cuanza; fl. middle of Jan. 1857. No. **5685**.

5. **S. cuneifolia.**

Clerodendron cuneifolium Baker ms. in Herb.

Flowering branchlets obtusely quadrangular, pallid, clothed with short curly hairs mixed with some long jointed ones; internodes shorter than the leaves, not or scarcely thickened; leaves opposite, erect-patent, obovate, narrowly and abruptly cuspidate at the apex, narrowed towards the often obtuse trinerved base, membranous, deep green and adpressedly hairy above, pallid and hairy at least along the midrib and principal veins beneath, irregularly toothed along the upper part below the cusp, entire below, $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long by $1\frac{1}{8}$ to $1\frac{3}{4}$ in. broad; lateral veins about 6 on each side of the midrib, slender, erect-patent; petiole $\frac{1}{3}$ to $\frac{1}{2}$ in. long, hairy, often bent at one or both ends, the base thickening; flowers crowded in dense subsessile terminal hemispherical abbreviated cymes or heads; bracts elliptical, acute at both ends, about $\frac{1}{2}$ in. long; calyx deeply lobed, $\frac{2}{3}$ in. long; the lobes elliptical, acute, ciliate, veiny, nearly $\frac{1}{2}$ in. long; corolla-tube slender, $1\frac{1}{2}$ to 2 in. long, thinly pubescent; the limb about $\frac{1}{2}$ in. in diameter; filaments and style exserted.

Pungo Andongo.—No precise locality; in fl. No. **5684**.

This closely resembles the last species, but the shape of the leaves is different.

6. **S. splendens.**

Clerodendron splendens G. Don in Edinb. Phil. Journ. xi. p. 349 (1824).

Zenza do Golungo.—In wooded places at the Mongolo river, Muxáo; fl. Sept. 1854. No. **5664**.

Golungo Alto.—On rocks and in bushy places between Cacarambola and Cambondo; fl. beginning of Feb. 1855. No. **5646**. A shrub, 4 to 5 ft. high, climbing with divaricate branches; leaves softly coriaceous, bullate-rugose; flowers very pleasantly flesh-coloured to reddish. In the Alto Queta secondary thickets, rather rare; fl. beginning of August 1856. No. **5740**. A shrub with splendid purple flowers; capsules shining, black; endocarp orange in colour. From Calôlo to Camilungo, plentiful. At Sange; fr. Sept. 1855. Apparently this species. Coll. Carp. 850.

Var.? **Bakeri.**

Scandent; leaves villose-tomentose, cordiform, ranging up to

5 in. long by $4\frac{1}{8}$ in. broad, cuspidate-acuminate at the apex; petioles ranging up to 6 in. long or more; flowers about $1\frac{1}{3}$ in. long, brilliantly scarlet; calyx 5-cleft.

Sierra Leone.—At Sierra Leone, cultivated and perhaps indigenous; fl. Sept. 1853. No. **5653**.

This variety is possibly the climbing shrub with very beautiful flowers, growing by fences in mountainous situations near Freetown in Sierra Leone in Dec. 1853, and mentioned by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 7 (Aug. 1854), p. 83. n. 75.

7. **S. glabra.**

Clerodendron glabrum E. Mey. Comment. Pl. Afr. Austr. p. 273 (1837).

Loanda.—In the churchyard of the island of Loanda; fl. and fr. March 1854. No. **5651**. A shrub, 4 to 6 ft. high, the whole plant smelling like cooked meat; stems numerous, branched or simple; branches sometimes erect, sometimes patent; flowers white, In bushy sandy places behind Maranga do Povo; fl. Feb. 1858. No. **5710**. A patently branched, fetid shrub, 4 to 7 ft. high, with white flowers. In sandy places at the seaside near Praia de Zamba Grande; fl. beginning of Feb. 1858. No. **5721**. A much-branched shrub, 4 to 6 ft. high; leaves ternate, somewhat fleshy, glossy, yellowish green, rather flaccid, strong-smelling; flowers pentamerous, white, fragrant; calyx-lobes lanceolate-subulate; corolla-lobes rounded-obtuse, somewhat wavy; stamens 4 or 5 or 6; stigma somewhat bifid; drupe spherical or nearly so, turning black when ripe, 4-furrowed, mucronate with the remains of the style, received at the base into the 5- to 7-toothed calyx. In sandy rugged places above Loanda, near Alto das Cruzes, not uncommon; fl. and unripe fr. 8 Dec. 1858. No. **5625**. In fl. No. **5657**.

Icolo e Bengo.—Near Foto; without fl. or fr. Perhaps this species. No. **5655**.

Var. **incarnata.**

A shrub, 2 to 5 ft. high; branches shortly and softly pubescent, erect or spreading; leaves coriaceous, herbaceous green, somewhat fleshy, 1 to 2 in. long by $\frac{1}{2}$ to 1 in. broad, mostly ternate; petiole $\frac{1}{4}$ to $\frac{1}{2}$ in. long; flowers flesh-coloured; stamens 4.

Mossamedes.—In thickets at the mouth of the river Bero, in sandy somewhat salt places; fl. July 1859. No. **5753**.

This variety has the habit of *S.* (*Clerodendron*) *Rehmannii* (Gürke in Pl. Wilm. n. 601) from the Transvaal, but the foliage of our specimens is nearly glabrous and the corolla-tube is shorter.

Var. **vaga.**

A shrub, 2 to 3 ft. high, sparingly branched; branches pallid, tomentellous, rambling; branchlets hoary-tomentose; leaves mostly ternate or quaternate, $\frac{1}{2}$ to 1 in. long by $\frac{1}{4}$ to $\frac{1}{2}$ in. broad, more or less pubescent; petiole $\frac{1}{8}$ to $\frac{1}{4}$ in. long; flowers white.

Benguella.—In maritime thickets near Benguella; fl. March 1859. No. **5752**.

8. **S. volubilis.**

Clerodendrum volubile P. Beauv. Fl. Ow. i. p. 52, t. 32 (1806?). *C. multiflorum* G. Don in Edinb. Phil. Journ. xi. p. 350 (1824).

Zenza do Golungo.—At Muchâo; fl. Sept. 1854. No. **5675**.

Golungo Alto.—A low shrub, occasionally climbing with long sarmentose branches; calyx corolline, white, persistent; corolla from greenish to whitish, deciduous; berries black, shining. In secondary woods near Calôlo and Muria; fl. and unripe fruit, Sept. 1854. No. **5630**. At Quibôlo; fl. Aug. 1856. No. **5659**. In fl. No. **5680**.

9. **S. formicarum.**

Clerodendron formicarum Gürke in Engl. Bot. Jahrb. xviii. p. 179 (22 Dec. 1893). *C. triplinerve* Rolfe in Bol. Soc. Brot. xi. p. 87 (1894).

Golungo Alto.—In dry hilly places on the lower ranges of the Queta mountains; fl. and fr. Nov. 1854. No. **5622**. A shrublet, sometimes 1 to 2 ft. high and standing erect, sometimes climbing to the height of 4 to 5 ft.; leaves ternate; flowers white. In sunny thickets among the Queta mountains; fl. June and July 1856. No. **5661**.

10. **S. costulata** Hiern, sp. n.

Glabrate on most parts, except the minutely puberulous inflorescence; branches woody, rather slender, subterete or slightly compressed at the nodes, lenticellate, leafy towards the extremities; leaves opposite, spreading, oval, subelliptical or somewhat obovate, obtusely acuminate and apiculate at the apex, rounded or obtusely or obliquely narrowed at the base, entire or undulate-subrepand on the very narrowly revolute margin, sometimes unequally 3-nerved at the base, thinly coriaceous, rather glossy, somewhat paler beneath, 2 to 4 in. long by $\frac{3}{4}$ to $2\frac{1}{4}$ in. broad; veins and reticulation slender; petioles $\frac{1}{8}$ to $\frac{3}{4}$ in. long, transversely rugose, the older ones usually articulate and bent at a right angle near the base, the lower part thicker and often persistent, the upper part (or the leaf-base) often bent again at the apex; inflorescence paniculate, obtusely pyramidal, many-flowered, bracteate, about 2 to 3 in. in diameter, 4 to 6 in. long, terminating the branches or branchlets; the primary divisions patent, rather lax, opposite, slender; the ultimate pedicels $\frac{1}{8}$ to $\frac{1}{5}$ in. long, slender, sometimes bracteolate; bracts and bracteoles narrow; flowers pentamerous; calyx campanulate-oblong, delicately ribbed longitudinally, shortly lobed, about $\frac{1}{5}$ in. long; the lobes rather narrowly deltoid, acute, nearly equal; corolla tubular; the tube $\frac{1}{3}$ to $\frac{3}{8}$ in. long, rather slender; the limb spreading or reflected, sub-bilabiate, deeply lobed; the lobes roundly obovate, $\frac{1}{8}$ to $\frac{1}{6}$ in. long; the throat funnel-shaped; stamens 4, didynamous, exserted; the filaments inserted at the bottom of the corolla-throat, $\frac{1}{3}$ and $\frac{3}{8}$ in. long; anthers about $\frac{1}{24}$ in. long; style about equalling or slightly exceeding the longer filaments, bifid at the top.

Pungo Andongo.—In fl. Nos. **5679**, **5682**.

This species has the aspect of *S.* (*Clerodendron*) *Buchholzii* [Gürke in Engl. Bot. Jahrb. xviii. p. 176 (1893)], but the flowers and leaves are smaller and the net-veins on the lower surface of the leaves more conspicuous; it differs from *S.* (*C.*) *Preussii* (Gürke, *l.c.*, p. 175) by the shape of the calyx, etc.

11. **S. botryodes** Hiern, sp. n.

A sarmentose, glabrous shrub; branches terete, smooth; leaves opposite subopposite or alternate, elliptical or oblong, obliquely

obtuse rounded or subcordate at the base, mostly acuminate at the apex, herbaceous, 3 to 12 in. long by 1½ to 5 in. broad, green above, rather paler beneath, entire or occasionally paucidentate-repand, minutely punctate, caducous at the time of the flower; reticulation slender, inconspicuous above; petioles 1 to 2 in. long, articulate and often abruptly bent above the base, the upper part deciduous with the leaves, often leaving the thickened lower part subpersistent and somewhat resembling blunt spines; inflorescence oblong, 2 to 9 in. long, minutely puberulous, axillary or arising from the thicker branches even at the base of the shrub, many-flowered, pedunculate, bracteolate; ultimate pedicels $\frac{1}{20}$ to $\frac{1}{10}$ in. long; ultimate bracteoles narrow; flowers white with rosy tint; calyx campanulate-oblong, $\frac{1}{5}$ in. long, minutely glandular-puberulous, shortly 5-lobed; lobes deltoid, acute; corolla tubular, funnel-shaped, $\frac{1}{2}$ to $\frac{5}{8}$ in. long, 5-lobed, sub-bilabiate; the lobes obovate, rounded at the apex, not very unequal, about $\frac{1}{6}$ in. long; stamens 4, subdidynamous, exserted, glabrous; filaments inserted at the bottom of the corolla-throat, $\frac{2}{5}$ to $\frac{1}{2}$ in. long; anthers $\frac{1}{15}$ in. long; style glabrous, exserted, nearly reaching the top of the longer filaments, bifid at the tip.

Golungo Alto.—In secondary woods by rivulets in Sobato de Mussengue; fl. Aug. 1855. No. **5714**. In the shady parts of the Sobatos Bumba and Bango, at the banks of streams, not uncommon; fl. Sept. 1855. No. **5738**. In the forest near Menha Lula in Sobato de Mussengue; fl. Sept. 1855. No. **5662**. At Quibôlo; leaves of the previous year (soon falling), without fl. or fr. May 1856. No. **5711**.

The two following Nos. may be compared with this species, but the leaves are wedge-shaped at the base:—

Golungo Alto.—A young shrub-like little tree, 5 ft. high; trunk ashy, straight, oppositely spiny; branches compressed near the nodes; the upper leaves membranous, the lower leaves coriaceous. At the cataracts of the river Cuango; without fl. or fr. May 1855. No. **4537**.

Golungo Alto.—A robust shrub, scandent and pendulous; leaves alternate, coriaceous, shining. In secondary thickets grown up after the burning of the forests; without fl. or fr. Dec. 1855. No. **6713**.

12. **S. myricoides.**

Clerodendrum myricoides R. Br. in Salt, Abyss., App. p. lxv. (1814), name only. *Spironema myricoides* Hochst. in Pl. Abyss. exsicc. i. n. 330 (1840). *Cyclonema myricoides* Hochst. in Flora xxv. p. 225 (1842).

Loanda.—A tall shrub, well worth cultivating, 3 to 5 ft. high; stems numerous, erect or oblique, pale green, marked with white scars, virgate, trichotomously branched; leaves acuminate at the apex, attenuate and quite entire at the base, strongly serrate in the middle, membranous, bright green, more or less puberulous; calyx almost constantly glabrous, blackish purple or greenish purple, its lobes very obtuse; corolla pale blue, the middle lobe of the lower lip blue and thus making the flower to resemble almost exactly that of a dog-violet; stamens in the late flowers not uncommonly very short and not circinate; drupes blackish purple, when fully ripe certainly juicy, edible, 4-pyrenous or by abortion 3- to 1-pyrenous. In quite dry and

also in moist sandy bushy places from Penedo to Quicuxe, not uncommon, in dull rainy seasons flowering and fruiting two or three times in a year; near Quicuxe, fl. and fr. 7 Feb. 1859. No. **5700**. At Penedo; fr. with scarcely good seeds, April 1854. Coll. Carp. 851.

Golungo Alto.—A shrub, formed like a little tree, 4 to 6 ft. high; trunk simple, straight; head much branched; flowers in shape and colour like dog-violets. In mountainous rocky places about Sange; fl. March 1856. No. **5698**. A form with rather larger foliage and flowers. No. **5623**. In fl. No. **5708**.

Pungo Andongo.—A very elegant little tree, 7 to 9 ft. high; trunk slender, straight, below without branches; head broadly ovate, densely leafy, 6 to 8 ft. in diameter; leaves membranous but somewhat fleshy, turning black and falling off in drying, deep green and but little glossy above, pallid beneath; flowers very abundant, pale blue, the lip more deeply coloured. In the rocky pastures of Pedra de Cabondo, rather rare; fl. Nov. 1856. No. **5699**. An undershrub, 1½ to 3 ft. high, erect or ascending at the base; leaves ternate or quaternate, subcoriaceous, somewhat shining above, paler beneath; flowers handsome, from cornflower-blue to sky-blue, resembling those of a violet. In rocky thickets about Caghuy, plentiful; fl. end of Nov. 1856. No. **5704**. A shrub, 4 to 9 ft. high, much branched from the base; leaves membranous but somewhat fleshy, deep green above, scented like cooked pork; corolla pale blue, the lip concave and more deeply violet-blue. In wooded thickets near Quilange; fl. and unripe fr. Dec. 1856. No. **5707**. A handsome undershrub, 2 to 3 ft. high; rhizome woody, polycephalous; stems numerous, erect or oblique, sparingly branched; leaves quaternate, subverticillate, shining; flowers very pleasantly violet-blue; drupes turgid, 2- or 3- or rarely 4-lobed, when quite ripe blackish purple, with only a little red juice, eaten by the negroes. On the more barren plains and in rocky thickets about Pungo Andongo, very plentiful; fl. and fr. from Feb. to April 1857. No. **5703**. In fl. Nos. **5681**, **5683**.

Var. **herbacea**.

A perennial herb, with many erect branches from the base, 1½ to 2 ft. high; flowers pale sky-blue, rather larger than in the type.

Huilla.—In wooded places at lake Ivantâla; fl. and fr. Feb. 1860. No. **5768**.

This species is probably the plant mentioned by Welwitsch in Ann. Cons. Ultramar. Lisboa, No. 7, p. 84, n. 91 (Aug. 1854); and in Bol. Offic. Gov. Angola, No. 700, p. 7. n. 91 (26 Feb. 1859). He described it as a shrub of 4 to 6 ft., with very elegant whitish violet flowers like a violet; it was found rather rare in Loanda thickets in Jan. 1854.

13. **S. assurgens** Hiern, sp. n.

A robust undershrub or a shrub of 6 to 10 ft. high, climbing high and widely; stems woody at the base and upwards, becoming whitish, quadrangular; branches softly pubescent; leaves opposite, oval or somewhat elliptical, pointed obtuse or acuminate at the apex, more or less obliquely narrowed or obtuse at the base, somewhat fleshy, rigid, scarcely glossy deep-green and with scattered adpressed hairs above, paler and more closely clothed with hairs and minute glands beneath, entire or nearly so, 3 to 5 in. long by 1½ to 3½ in. broad, the floral ones smaller; lateral nerves 4 to 7 on each side of the midrib, rather slender; petioles ranging up

to an inch long, pubescent-tomentose; inflorescence consisting of comparatively few-flowered lax leafy bracteate pubescent terminal panicles narrowing towards the apex; lower peduncles axillary, 3- to 1-flowered, slender, spreading, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, the upper ones successively shorter; pedicels ranging up to $1\frac{1}{2}$ in. long, mostly shorter; bracteoles narrow; flowers violet-blue but less brightly so than in *S. myricoides*; calyx shortly campanulate, $\frac{1}{5}$ in. long, persistent, hairy outside, shortly 5-lobed, the lobes obtuse or rounded; corolla glabrous outside or nearly so; the tube about $\frac{1}{4}$ in. long and broad, ventricose; the limb bilabiate, about $\frac{1}{2}$ in. long; the lobes large, obovoid, rounded at the apex, spreading; the throat hairy; stamens 4, far exserted, nearly $1\frac{1}{2}$ in. long, somewhat unequal, glabrous, inserted at the top of the corolla-throat; style reaching about the same height, slender, glabrous, bilobed at the apex; young fruit subglobose, about $\frac{1}{3}$ in. in diameter.

Pungo Andongo.—In the primitive woods of Mata de Pungo; fl. and young fr. Feb. 1857. No. **5702**. In bushy places at the outskirts of primitive forests and in shady rocky places, rather rare; fl. and young fr. April 1857. No. **5701**. In small primitive woods in the præsidium; fl. April 1857. No. **5706**.

This species belongs to the section Cyclonema.

14. **S. dumalis** Hiern, sp. n.

A shrublet, 1 to 2 ft. high; branches subterete, pale brown, glabrate, inconspicuously lenticellate; branchlets softly pubescent-tomentose, leafy at the extremities; buds tomentose; leaves opposite, oval-obovate or elliptical, obtuse or pointed at the apex, wedgeshaped at the base, firmly herbaceous, closely beset with short stiff pale hairs and minute glands especially beneath, entire or nearly so, pale green, 1 to $1\frac{1}{2}$ in. long by $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, the floral ones smaller; petioles $\frac{1}{8}$ to $\frac{1}{4}$ in. long; inflorescence terminal or sub-terminal, somewhat leafy and bracteate, rather lax, 2 to 4 in. long, hispid-tomentose, the primary branches patent, brachiate; common peduncle $\frac{1}{4}$ to $1\frac{1}{4}$ in. long; pedicels ranging up to $\frac{1}{2}$ in. long; bracteoles spathulate or subulate; flowers blue, rather numerous; calyx shortly and obliquely campanulate, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, minutely glandular and beset with short whitish stiff hairs outside, smooth inside, shortly lobed; lobes rounded at the apex, imbricate at the base, ciliolate; corolla-tube $\frac{1}{4}$ to $\frac{3}{8}$ in. long, $\frac{1}{8}$ in. broad, oblique, ventricose, minutely glandular outside; limb sub-bilabiate, spreading, veiny, unequally 5-partite; the lobes oval or obovate, rounded at the apex, $\frac{1}{3}$ to $\frac{1}{2}$ in. long; throat shaggy, slit down one side; stamens 4, subdidynamous, exserted; filaments glabrous above, shaggy at the base, inserted at the bottom of the corolla-throat, $\frac{3}{4}$ to $\frac{7}{8}$ in. long; anthers $\frac{1}{15}$ in. long, glabrous; ovary glandular-squamulose; style glabrous, equalling or rather exceeding the stamens, cleft at the apex; fruit quadrate-globose, somewhat compressed, furrowed down the two sides, $\frac{1}{3}$ in. long and broad, $\frac{1}{6}$ in. thick, blackish.

Huilla.—In thickets near Lopollo; fl. Oct. 1859; fr. Jan. 1860;

in company with *Psiadia arabica* Jaub. & Spach (Welw. herb. no. 3914) and *Duranta erecta* L. (Welw. herb. no. 5760). No. **5763**.

This belongs to the section Cyclonema and comes near to *S.* (*Cyclonema*) *discolor* (Kl.) and to *S.* (*Clerodendron*) *Neumayeri* (Vatke).

8. **AVICENNIA** L. Syst. Nat., edit. 1 (1735); Sp. Pl., edit. 1, p. 110 (May 1753); Benth. & Hook. f. Gen. Pl. ii. p. 1160.

Bontia P. Br. Hist. Jam. p. 263 (1756); L. Syst. Nat., edit. 10, part ii., p. 1122 (1759); non L. (1735 and 1753).

1. **A. nitida** Jacq. Sel. Stirp. Amer. Hist. p. 177, t. 112, f. 1 (1763); L. Gen. Pl., edit. 6, p. 579 (1764).

Bontia germinans L. Sp. Pl., edit 2, p. 891 (1762), partly. *A. africana* P. Beauv. Fl. Ow. i. p. 80, t. 47 (1806?); Benth. in Hook. Niger Fl. p. 487 (1849); Welw. in Proceed. Linn. Soc. ii. p. 328 (1854).

Ambriz.—Sometimes a great tree. Loge river; fl. and fr. Nov. 1853. No. **5726**.

Loanda.—At Zamba grande; fl. March 1854. No. **5641**. A much-branched little tree, 6 to 10 ft. high. At Praia da Zamba grande; fl. July 1858. No. **5709**. Also near Maianga do Rei, with erect asparagus-like radical shoots, on sand-banks, 26 Oct. 1853. A single tree, about 25 ft. high; at the right bank near the mouth of the river Bengo, Nov. 1853. A shrub of 5 to 8 ft., with milk-white flowers; on the coast of the island of Loanda, fl. and fr., Oct. 1853, in company with *Rhizophora Mangle* L. The seeds germinate within the pericarps; cotyledons very broad, conduplicate, bilobed at the base; plumule seated on a scape.

The Lichen n. 335 at Maiango do Povo, in Loanda, Feb. 1854, grew on the *Avicennia*; also Lichen n. 410 at Zamba grande, Dec. 1858.

The following is a very doubtful member of Verbenaceæ; the short account of the fruit is taken from Welwitsch's ms.:—

A handsome tree, 40 to 80 ft. high; bark strongly cracked; branches erect-spreading, terete, dusky-ashy, lenticellate, glabrous; young shoots shortly puberulous, leafy; leaves opposite and subalternate, simple, exstipulate, oval or oblong, with a somewhat frangulaceous habit, rounded or obtuse at both ends and often mucronulate at the apex, thinly coriaceous or firmly membranous, minutely glandular on both faces, dark green and glabrate or more or less figured with patches of scaly puberulence above, paler or browner and often shortly pubescent by the sides of the midrib and lateral veins beneath, evergreen, entire or wavy-repand on the very narrowly revolute glabrous margin, 2 to 4 in. long by $\frac{7}{8}$ to 2 in. broad; lateral veins about 8 on each side of the midrib, rather slender, erect-patent, sub-parallel; net-veins also sub-parallel, delicate; petiole $\frac{3}{8}$ to $\frac{2}{3}$ in. long, articulate at the base, glabrate or shortly puberulous; fruit small, edible, called by the negroes "Mungingi."

Libongo.—In a cultivated tamarind plantation, in Banza de Libongo; only one tree: without fl. or fr. 19 to 22 Sept. 1858. No. **6737**.

Golungo Alto.—Leafy branch; without fl. or fr. No. **6737***b*.

The plant called "Mungingue" in Huilla is *Fadogia Cienkowskii* Schweinf., *ante*, p. 481.

XCVII. LABIATÆ.

Plants of this order are scarce in the coast regions of Angola, and are not plentiful in the mountainous forest districts, but in the highland-plateau regions they gradually increase both in genera and species, and become so abundant in individuals that they exercise a decided influence on the physiognomy of the pastures and banks of streams. Some genera are especially conspicuous in consequence of their large white or rosy bracts at the base of the white or violet-coloured flowers; several species have filipendulous rhizomes, and some are very pleasantly aromatic; the two species of *Tinnea* furnish from their dried leaves antiscorbutic powders; and the genus *Alvesia*, when seen without its flowers, much resembles rosemary.

1. **OCIMUM** L.; Benth & Hook. f. Gen. Pl. ii. p. 1171, partly.

1. **O. americanum** Miller ex L. Diss. Cent. Pl. i. p. 15, n. 42 (1755) (*Ocymum*); Mill. Gard. Dict., edit. 8, n. 4 (1768).

O. stamineum Sims, Bot. Mag. t. 2452 (1824), with descript. *O. canum* Sims, *l.c.*, name.

Ambriz.—In fr. No. **5566**.

Loanda.—A rather dwarf annual, often whitish-hirsute throughout when in young flower. By pools in a sandy clay soil, near Forte de Conceicão; fl. and fr. 12 July 1854. No. **5618**. An annual, erect, rather much-branched herb, 1 to 2 ft. high, bright green in the living state, soon becoming hoary in drying; aroma agreeable; flowers white or whitish lilac. In dry hilly sandy and also on a moist clay soil, throughout the district, plentiful; in the pastures behind Penedo; fl. and fr. end of Feb. 1858. No. **5583** (partly). An annual herb, 1 to 2 ft. high, branched like a broom; flowers violet-whitish. In rather dry hilly places about Loanda, plentiful; at Maianga del Rei, fl. and fr. Jan. 1859. Nos. **5570**, **5567**, **5568** (partly).

Golungo Alto.—Between Trombeta and Cabonda; fl. and fr. Sept. 1854. No. **5571**. An annual herb, met with during the whole year on rubbish heaps, very pleasantly fragrant; in cultivated and also in uncultivated places at the margins of drying-up streams, plentiful; at Sange; fl. and fr. July 1855. No. **5569**. Wild everywhere and probably indigenous; at Sange; fl. March 1856. The "Machericão (N-xilicá)" of Golungo Alto. No. **5573**. A low shrublet, 1 to 2 ft. high; the lower branches woody, very crowded, decumbent, tortuous, densely intricate; the flowering branches and branchlets erect; leaves hoary-green, without gloss, paler beneath, with a peculiar scent which was not noticed in the rest of the genus and nearly resembled that of the lemon; flowers very fugacious; corolla whitish, here and there spotted with violet, bilabiate, the upper lip obtusely 4-lobed, the lower lip ovate-spathulate and entire, both lips long-ciliate, the tube naked; stamens much projecting; anthers whitish; style deep purple, bifid at the apex. On very dry declivities on the right bank of the river Delamboa, rather rare: fl. and fr. end of March 1856. No. **5574**. At Pereira's house; fr. end of March 1856. Coll. Carp. 853. Flowers whitish-reddish. In the hilly parts of Quilombo Quiacatubia, in short grass; fl. and fr. No. **5617**.

Mossamedes.—An annual herb, a foot high, pyramidally branched.

In the hilly sandy rocky parts of S. Antonio, sporadic ; fl. and fr. end of June 1859. A late specimen. No. **5504**.

This is apparently the species of *Ocimum*, cultivated by the colonists in Golungo Alto, and also wild, which is called "mangericão," a Portuguese name which the negroes pronounce *n'gilicá*. See Ficalho, Pl. Uteis, p. 241 (1884).

It is perhaps the *Ocymum* species mentioned by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 250. n. 118, as an undershrub remarkable for its very agreeable aroma and growing at Boa Vista, Cacuaco, 10 Aug. 1854.

This species is perhaps not distinct from *O. basilicum* L. ; according to Miller it grew naturally in India.

The following note, which was found in Herb. Welw. with No. 6554 (*Philoxerus vermiculatus* Sm.) but cannot belong to it, is called *Ocimum*, and possibly relates to No. 5568 as applied to this species or to No. 5567 :—

Loanda.—An erect herb, 2 to 2½ ft. high, patently branched, but little aromatic with the scent of *Ocimum* ; leaves somewhat limp, beneath densely glandular-punctate, somewhat whitish ; flowers in distant subsecund 3- to 7-flowered whorls ; calyx with the lower teeth long-subulate, contiguous, nearly connate ; corolla bilabiate, white, the lower lip entire, the upper lip trifid, the middle lobe bifid ; style bifid at the apex, with subulate branches ; nutlets 4, obovoid, nearly glabrous. In steep places on a sandy clay soil, above Penedo ; fl. and fr. July 1858.

2. **O. basilicum** L. Sp. Pl., edit. 1, p. 597 (1753).

Cape de Verde Islands.—In the island of St. Jago ; fr. Jan. 1861. A poor specimen, probably of this species. No. **5588**.

3. **O. viride** Willd. Enum. Hort. Berol. p. 629 (1809).

Golungo Alto.—A suffrutescent herb, 4 ft. high or more, strongly and very agreeably aromatic ; rootstock woody ; stems numerous, branched above. In open secondary thickets between Trombeta and Cambondo ; fl. and fr. end of May 1855. No. **5564**. An undershrub or almost a shrub, 3 to 5 ft. high, quasi-evergreen ; aroma peculiar, very pleasant ; stems many from the same rootstock ; leaves dull green. Occasional by negro villages, about Sange, Camilungo, etc. ; fl. and fr. 19 July 1855. No. **5575**.

4. **O. suave** Willd., *l.c.*

Pungo Andongo.—A tall herb, very agreeably sweet-scented throughout ; rootstock becoming woody, perennial ; stem obtusely tetragonal, deeply 4-furrowed, branched, 3 to 4 ft. high, woody at the base ; leaves soft, somewhat limp, pale green above, turning pallid beneath, very densely beset with pellucid dots ; flowers white. In bushy places at the base of the gigantic rocks near Caghuy, in company with Verbenaceæ (cf. *Siphonanthus stricta* ; Welw. herb. no. 5685) ; fl. and fr. 23 Jan. 1857. No. **5572**. Pedras de Guinga ; in very young fl.-bud Jan. 1857. A poor specimen, perhaps belonging here. No. **5744**.

5. **O. hians** Benth. in DC. Prodr. xii. p. 36 (1848).

Var. **macrocaulon** Briq. in Engl. Bot. Jahrb. xix. p. 161 (1894).

Huilla.—Flowers whitish violet in colour. At Ferrão da Sola ; fl. and fr. beginning of April 1860. No. **5493**.

This is very nearly related to *O. knyanum* Vatke, but the inflorescence is somewhat denser in our specimens than in the latter species.

Var. **microphyllum** Briq., *l.c.*

Huilla.—At Mumpulla; fl. and fr. Oct. 1859. No. **5514**.

6. **O. knyanum** Vatke in Linnæa xxxvii. p. 315 (1872).

Loanda.—In fl. and fr. Nos. **5568** (partly), **5583** (partly).

Mossamedes.—An annual, pleasantly aromatic, erect herb, with whitish or purplish flowers. In sandy places, close to the river Bero, here and there; fl. and fr. July 1850. A poor specimen, perhaps of this species. No. **5505**.

Our specimens differ from the type of the species by being less pubescent.

7. **O. modestum** Briq., *l.c.*, p. 162.

Huilla.—Flowers whitish with a violet tinge. In rocky pastures near Lopollo, among low bushes; fl. Nov. and Dec. 1859. No. **5518**.

8. **O. laxiflorum** Baker, sp. n.

An erect, branched, suffruticose herb, 2 to 4 ft. high, sweetly smelling like balm but less powerfully so; stems slender, several, pubescent; leaves opposite, ovate, pointed or sub-obtuse at the apex, obtuse or nearly rounded at the base, thinly herbaceous, sparingly pubescent and minutely glandular, dark green above, paler beneath, crenate or serrate-crenate, 1 to $1\frac{2}{3}$ in. long by $\frac{1}{2}$ to $1\frac{1}{3}$ in. broad; petiole $\frac{1}{4}$ to $\frac{2}{3}$ in. long, hirsute; racemes terminal and in the upper axils, slender, pubescent, glandular, 3 to 8 in. long, shortly pedunculate; verticils 2- to 6-flowered, bracteate at the base, the lower ones distant; pedicels about $\frac{1}{8}$ to $\frac{1}{6}$ in. long; bracts oval, $\frac{1}{10}$ to $\frac{1}{8}$ in. long; flowers $\frac{3}{16}$ in. long, white; soon withering; calyx obliquely oblong, gibbous at the base, ribbed, $\frac{1}{6}$ in. long in flower, $\frac{1}{5}$ in. long in fruit, 5-cleft, minutely glandular, bilabiate, spreading or turning downwards in fruit, the posterior lobe oval, more or less spreading; the anterior lobes subulate, erect; the lateral lobes deltoid-acuminate; corolla small, the tube straight, about $\frac{1}{8}$ in. long, the limb bilabiate; stamens 4, didynamous, scarcely exserted; filaments glabrous, not appendaged; style about equalling the longer filaments, somewhat thickened at the bifid stigmatic apex; nutlets ovoid-oblong, $\frac{1}{16}$ in. long.

Golungo Alto.—By thickets close to the banks of the river Cuango, not common; fl. and fr. March 1856. No. **5554**. In fl.-bud. Perhaps this species. No. **5584**.

Pungo Andongo.—By moist thickets in the præsidium, not plentiful; fl. and young fr. beginning of Nov. 1856. No. **5553**. In thickets in many spots but nowhere plentiful, by the Luxillo road; fl. and fr. Jan. 1857. No. **5552**.

This species belongs to the section Gymnocimum.

9. **O. andongense** Hiern, sp. n.

An erect, perennial, glabrescent herb, nearly 2 ft. high; stems rather slender, somewhat branched in the upper half, puberulous at the apex; leaves opposite, linear or oblong-linear, subobtuse at the apex, narrowed at the sessile or shortly petiolate base, minutely glandular or glabrate, firmly herbaceous, minutely punctulate, denticulate on the upper half of the margins, 1 to $1\frac{3}{4}$ in. long by $\frac{1}{12}$ to $\frac{1}{8}$ in. broad; venation distinct, branched;

inflorescence terminal, the central spike about a foot long; verticils distant or the upper ones contiguous, 4- to 6-flowered, bracteate at the base; bracts puberulous, small, broad, caducous; pedicels very short; flowers whitish-rosy, nearly glabrous, spreading, large; calyx about $\frac{1}{4}$ in. long, tubular, somewhat puberulous, pendulous in fruit, bilabiate, short 5-lobed; the posterior lip broad, entire, dark at the tip; the anterior lip 4-lobed, denticulate-fimbriate, thin, the lobes subulate at the apex from a broader base; corolla $\frac{3}{4}$ in. long or rather more, bilabiate, the tube about $\frac{3}{8}$ in. long, straight; stamens 4, didynamous; filaments exserted, free among themselves, the longer pair about $1\frac{1}{8}$ in. long, the shorter pair about $\frac{3}{4}$ in. long; style far exserted, $1\frac{1}{4}$ in. long, slender, bifid at the apex; the style-branches slender, subulate, nearly equal; nutlets 4, oblong.

Pungo Andongo.—In a sandy thicket between Cazella and Luxillo; only one specimen; fl. 18 Oct. 1856. No. **5769**.

10. **O. huillense** Hiern, sp. n.

A suffruticose herb; stem ascending from a decumbent base, 15 in. high, obtusely tetragonal above, leafy and clothed with short whitish spreading scattered hairs; leaves narrowly elliptical, contracted towards the subacute apex, somewhat wedge-shaped at the shortly petiolate base, firmly herbaceous, more or less sparingly clothed with short whitish hairs, dark green above, rather ruddier minutely glandular and punctulate beneath, repand or remotely denticulate on the margin, about 3 in. long by $\frac{3}{4}$ in. broad; inflorescence about 4 in. long, terminal, more or less clothed with short whitish spreading hairs; verticils about 6-flowered, the lower ones distant, the upper ones approximated, the uppermost ones forming the dense continuous apex of the spike; flowers subsessile, $\frac{5}{8}$ in. long; calyx campanulate, $\frac{1}{4}$ in. long, bilabiate; the posterior lip semicircular-ovate, subapiculate, $\frac{1}{8}$ in. long, erect in the flower, decurrent, dark purple, a little overlapping the anterior lip at its base; anterior lip, truncate-ovate, with two short subulate teeth at the apex which reaches about as high as the apiculus of the posterior lip, purple, densely ciliate along the top with short hairs which form a whitish frill; corolla-tube about $\frac{3}{8}$ in. long, funnel-shaped; the limb bilabiate; the posterior lip broad, trifid, with rounded lobes; the anterior lip oval, nearly as long; stamens 4, didynamous, exserted, the filaments coiled up together with the style in the bud, all free among themselves, glabrous, two of them with a broad tooth or appendage at the base; style exserted, glabrous, long, cleft at the apex into 2 short narrow branches.

Huilla.—In fl. No. **5488**.

2. **HEMIZYGIA** Briq. in Engl. Nat. Pflanzenfam. iv. 3*a*, p. 368 (1897), and in Ann. Conserv. & Jard. Genève, ii. p. 244 (Dec. 1898),

Ocimum sect. Hemizygia, Benth. in DC. Prodr. xii. p. 41 (1848). *Ocimum* Benth & Hook. f. Gen. Pl. ii. p. 1171, *partly*.

1. **H. tuberosa** Hiern, sp. n.

An erect or ascending, somewhat wiry herb, a few inches to a foot high; root thick, woody-tuberous, giving off numerous long fibres; stems glabrescent below, puberulous or shortly pubescent above and on the inflorescence; leaves narrowly elliptical, obtuse or subacute at the apex, wedge-shaped at the sessile or subsessile base, glabrous or nearly so, punctulate, serrate-dentate or remotely denticulate, firmly herbaceous, green above, paler beneath, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{6}$ to $\frac{3}{4}$ in. broad; inflorescence terminal, $1\frac{1}{2}$ to 2 in. long; common peduncle $1\frac{1}{2}$ to $2\frac{1}{4}$ in. long; verticils about 6-flowered, sessile; pedicels very short; calyx obliquely ovoid-campanulate, somewhat narrowed towards the obtuse base, $\frac{1}{4}$ in. long, bilabiate; the posterior lobe entire, rounded, subapiculate at the apex, nearly glabrous, erect and about $\frac{1}{12}$ in. long in the flower, decurrent; the anterior lip 4-lobed; the lateral lobes obliquely subquadrate, $\frac{1}{15}$ in. long, about $\frac{1}{12}$ in. broad at the base, puberulous, with subulate teeth along the upper margin, the teeth very short except those next the middle lobes of the anterior lip; the middle lobes subulate, $\frac{1}{15}$ in. long; corolla bilabiate, the tube short; stamens 4, didynamous, exserted, glabrous for the most part; two of the filaments free to the base, inserted at the lower part of the corolla-tube, with a blunt puberulous broad appendage near the base; the other two filaments united in the lower third part, glabrous throughout; style long, glabrous, cleft at the apex into 2 short narrow branches.

Pungo Andongo.—In rather dry hilly bushy places near Condo; fl.-bud March 1857. No. **5565**.

3. **GENIOSPORUM** Wall.; Benth. & Hook. f. Gen. Pl. ii. p. 1172.

1. **G. angolense** Briq. in Engl. Bot. Jahrb. xix. p. 164 (1894).

Huilla.—Flowers whitish-rosy. In damp meadows along the Ferrão da Sola stream; fl. and fr. Jan. 1860. No. **5490**. Flowers rosy-whitish. Along the Monino streams; fl. and fr. Jan. 1860. No. **5491**. In the damp elevated thickets of Morro de Lopollo; fl. end of April 1860. A more branched and weaker form than the type. No. **5498**.

Frequently the leaves are opposite and not ternately verticillate.

2. **G. strictum** Hiern, sp. n.

A strictly erect, smooth herb, 2 to 3 ft. high; stems striate or sulcate, minutely glandular-puberulous, rather slender, rigid, fistular; branchlets very slender, erect or ascending; leaves ternate quaternate or opposite; oblanceolate, shortly narrowed and apiculate at the apex, wedge-shaped to the subsessile or very shortly petiolate base, firmly herbaceous, glabrous or glabrescent, minutely pellucid-punctate, serrate along the upper half of the margins, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{4}$ to $\frac{1}{2}$ in. broad; verticils several or many-flowered, bracteate at the base; the upper ones crowded; the lower ones separate, more or less distant; spikes terminal and in the upper axils, solitary or ternate; the terminal one the longest, about 2 to 6 in. long, on a peduncle of 1 to 3 in. long; pedicels in the lower verticils about $\frac{1}{10}$ in. long, pubescent; the

lower bracts about $\frac{2}{3}$ in. long, ovate-rhomnoid, somewhat pubescent beneath, sessile, denticulate or subentire; the upper ones smaller; flowers purple; calyx $\frac{1}{15}$ in. long, obliquely campanulate-hemispherical, pubescent, sub-bilabiate; the 3 anterior lobes small, deltoid; the posterior lobe or lip not exceeding the others, rounded or subquadrate, entire or nearly so; corolla $\frac{1}{5}$ in. long, bilabiate; the tube $\frac{1}{10}$ in. long; stamens and style exserted.

HUILLA.—At the stream near Ferrão da Sola; fl. May 1860. No. **5499**.

3. **G. paniculatum** Baker ms. in herb.

An annual, usually erect herb of 2 to 4 ft., scarcely aromatic; the flowering stem simple or more or less branched, quadrangular, very deeply 4-furrowed, elongate-virgate, strictly erect or ascending or rarely pendulous, densely leafy up to the inflorescence except the lower part, puberulous or glabrate; leaves elliptical or ovate, narrowed to the obtuse or scarcely acute apex, wedge-shaped or nearly rounded at the subsessile or shortly petiolate base, opposite, often with leafy buds or prominently leafy shoots in the axils, crenate-dentate except the lower part, shortly hairy, puberulous or glabrate, rather strongly nerved to the base, spreading or pendulous, $\frac{2}{5}$ to $1\frac{2}{5}$ in. long by $\frac{1}{4}$ to $\frac{3}{4}$ in. broad; flowers whitish, very small, about $\frac{1}{12}$ in. long, subsessile, arranged in oblong or very short bracteate capitate spikes ranging up to nearly an inch long, axillary and terminal, altogether forming a terminal interrupted compound or subsimple narrow inflorescence of 4 to 12 in. long; bracts among the flowers broadly elliptical, pubescent on the back, nearly glabrous on the front, $\frac{1}{12}$ to $\frac{1}{8}$ in. long; calyx campanulate in flower and $\frac{1}{16}$ in. long, hairy outside, smooth inside, 5-cleft, scarcely bilabiate, 10-nerved, oblong and $\frac{1}{8}$ in. long in fruit; the lobes ovate or lanceolate; corolla puberulous outside; the tube very short, funnel-shaped, nearly straight; the limb small, bilabiate; the upper lip purplish, erect, emarginate or obsoletely bilobed; the lower lip directed forwards, shortly unguiculate at the base, hemispherical-concave, sub-entire, white; stamens 4, didynamous, ascending; anthers becoming blackish, almost circular, unilocular by the confluence of the cells; style cleft at the apex with 2 short spreading branches; nutlets 4, ovoid, somewhat compressed, slightly angular, about $\frac{1}{24}$ in. long, pale brown, marked with numerous minute papillæ.

PUNGO ANDONGO.—In wooded swampy places by streams, near Catete; fl. beginning of May 1857. No. **5528**. In swampy places near Quilanga; fl.-bud April 1857. No. **5529**. In the same locality at the banks of streams. A branched densely leafy form, apparently belonging to this species; without fl. or fr. Feb. 1857. No. **5529***b*.

HUILLA.—Flowers bluish white. By pools on the Monino stream; fl. April 1860. Apparently a slender state of this species. No. **5507**. On the banks of the stream near Ferrão da Sola; fl. May 1860. No. **5508**.

Var. **debile**.

Stems ascending or hanging down over rocks.

PUNGO ANDONGO.—At the Casalalà rivulet near Pedra Songue; fl. April 1857. No. **5527**.

This species has much the aspect of the section Spicaria of *Mesosphærum*.

4. **G. Mutamba** Hiern, sp. n.

A perennial herb, rarely flowering; root tuberous; tuber cylindrical, edible, resembling in taste the common potato and on this account cultivated by the negroes; stems ascending or flagelliform-descending, readily taking root at the nodes, puberulous below, pubescent above, minutely glandular; the sarmentose branches 2 ft. long or more; the flowering ascending stems 6 to 9 in. high; leaves oval or oblong, obtuse at the apex, obtuse or somewhat wedge-shaped at the base, thinly herbaceous, hispidulous, punctulate, pale yellowish green, remotely serrulate, shortly petiolate or subsessile, 1 to 4 in. long by $\frac{1}{3}$ to 2 in. broad; flowers about $\frac{3}{8}$ to $\frac{2}{5}$ in. long, shortly pedicellate, numerous, arranged in narrowly oblong subsessile terminal heads of 1 to 2 in. long or more; bracteoles among the flowers filiform, pubescent, $\frac{1}{10}$ to $\frac{1}{5}$ in. long; calyx about $\frac{1}{12}$ in. long, pubescent outside, minutely glandular, shortly 5-lobed, campanulate; the lobes ovate, nearly equal, ciliate, glabrous inside; corolla violet-rosy, about $\frac{1}{4}$ in. long; the tube narrowly funnel-shaped, not much curved, $\frac{1}{8}$ in. long; the limb bilabiate; one lip trifid; the other lip rather longer, obovate, suberect; stamens 4, exserted, free among themselves, didynamous; filaments shaggy below, glabrous above; anthers short; style exserted, bifid at the apex, glabrous; the branches short, slender, diverging.

Huilla.—In fields, wild and cultivated, at Lopollo; with foliage in Feb. and April 1860; fl. August. Native name "Mutamba" or "Tamba" or "I-tamba-jitamba." No. **5590**. In neglected plots and at the borders of fields, near Lopollo, at an elevation of 5200 ft.; fl. August 1860. No. **5496**.

In Loanda the name "Mutamba" or "Itamba" is used for *Grewia caffra* Meisn. (Welw. no. 1373), and in the lowlands near the river Quihumbo one of the common names of *Glyphæa grewioides* Hook. f. is "Mutamba"; the "*Mutamba*" of the Brazilians is a different plant from any of the above.

The following No. should be compared with this species, but its identity is very doubtful:—

Pungo Andongo.—A sarmentose, tomentose undershrub. In bushy rather dry places near Catete; Jan. to May 1857, but never seen to flower; a leafy shoot, Feb. 1857. No. **6744**.

4. **PLATOSTOMA** P. Beauv.; Benth. & Hook. f. Gen. Pl. ii. p. 1172 (*Platystoma*).

1. **P. africanum** P. Beauv. Fl. Ow. ii. p. 61, t. 95. f. 2 (1818?). *Ocymum sylvaticum* Thonn. ex Schum. in Dansk. Vidensk. Selsk. iv. p. 44 (1829). *Geniosporum Palisoti* Benth. Labiat. p. 22 (1832).

Sierra Leone.—In fl. and fr. No. **5581**.

Huilla.—In very elevated rocky places in the Monino country; young plants, without fl. or fr. April 1860. Determination quite doubtful. No. **5485**.

2. **P. flaccidum** Hook. f. Fl. Brit. Ind. iv. p. 611 (Aug. 1855); Briq. in Engl. Bot. Jahrb. xix. p. 165 (1894) (*Platystoma*).

Ocimum flaccidum A. Rich. Fl. Abyss. ii. p. 179 (1851). *P.* sp., Benth. & Hook. f., *l.c.*, p. 1173. *P. Schimperi* Hochst. in Pl. Schimp. Abyss., ed. 2. Hohenacker, n. 2045 (1852).

Golungo Alto.—A prostrate-ascending herb, with reddish flowers. In a cultivated place on the right bank of the river Cuango, in the arimo of Senhor Mariano among pot-herbs, seen only in one spot; fl. and fr. Dec. 1854. No. **5536**. A tender and insignificant annual herblet, erect or ascending, germinating flowering and fruiting within the space of 10 to 15 days; stem angular; calyx bilabiate, helmet-shaped after flowering, closed with the upper lip entire and the quite entire lower lip more closely incumbent; corolla pale violet in colour, more deeply violet on the lobes of the upper lip. In damp cultivated places in plantations of *Phaseolus* at the banks of the river Cuango, in company with *Cardamine trichocarpa* Hochst. (Welw. herb. no. 1189); fl. and fr. Sept. 1854 and Nov. 1855. No. **5535**. An annual, rooting herb, ascending or rather rarely somewhat erect; flowers very small, whitish, very caducous. By streams in the primitive forest of Quisuculo, in company with *Begonia oxyloba* Welw. herb. no. 875; fr. and very few fl. April 1856. No. **5534**.

Hooker, *l.c.*, considered this species as probably only a state of *P. africanum* P. Beauv.

5. **ACROCEPHALUS** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 1173.

1. **A. gracilis** Briq. in Engl. Bot. Jahrb. xix. p. 166 (1894).

Pungo Andongo.—A perennial herb, 1½ to 2 ft. high; stems in some instances erect, in others ascending; flowers violet in colour. In thickets on a sandy clay soil, near Luxillo; fl. beginning of May 1857. No. **5548**.

Huilla.—A strictly erect annual herb or undershrub, 1 to 1½ ft. high; stem quadrangular, branched; leaves linear-lanceolate, somewhat rigid, bright green, arching-patent or reflected; flowers blue or white-violet in colour, spicate-capitate; the heads very densely bracteate, shaggy, pale violet in colour. In bushy pastures on the Humpata plateau, fl. April 1860; in very elevated sandy sparingly bushy pastures in Morro de Lopollo, plentiful, fl. April and May 1860; also in very elevated sparingly herbaceous places in Morro de Lopollo, near Empalanca, fl. beginning of May 1860. No. **5515**.

2. **A. præaltus** Briq., *l.c.*, p. 168.

An erect herb, perennial, 3 to 4 ft. high, branched; branchlets trichotomous, erect-spreading, tetragonal; flowers capitate-spicate, densely bracteate, whitish with a violet tinge; bracts whitish; calyx urceolate-tubular, truncate or shortly bilobed, densely shaggy-bearded at the mouth, naked inside; corolla pale violet in colour, bilabiate; the tube exserted, nearly straight; the upper lip erect, emarginate at the apex, the lower lip trilobed, the middle lobe broader than the others; stamens 4, didynamous, exserted; filaments shaggy at the base; anthers versatile, the cells confluent, thickly patelliform; style filiform, undivided; stigma somewhat acute; young nutlets smooth.

Huilla.—In the forest among tall herbs, at the lake of Ivantâla;

fl. end of Feb. 1860. No. **5601**. At the outskirts of forests between Monino and Eme, and in the elevated wooded parts of Barrancos de Monino, at an elevation of 5000 ft. and more; fl. beginning of April 1860. No. **5600**. In Morro de Lopollo; fl. and fr. April 1860. No. **5602**.

3. **A. lippioides** Baker ms. in Herb. Kew.

A robust, erect, somewhat scabrid herb, 3 ft. high or more; rootstock woody; stem bluntly quadrangular, furrowed, puberulous, simple at least below; leaves opposite, narrowly elliptical, contracted towards both ends, firmly herbaceous, minutely punctate on both faces, crenulate on the margin, ranging up to 8 in. long by $2\frac{1}{4}$ in. broad; petioles ranging up to $\frac{3}{4}$ in. long; flower-heads ovoid-hemispherical, $\frac{1}{4}$ to $\frac{3}{8}$ in. in diameter, arranged in a terminal somewhat leafy corymb; basal bracts ovate-triangular, sessile, $\frac{3}{8}$ in. long, the other bracts among the flowers smaller and rounder; flowers subsessile, about $\frac{1}{5}$ in. long; calyx $\frac{1}{15}$ in. long, hairy outside below, bilabiate, the lobes short, entire, rounded; corolla-tube glabrous, $\frac{1}{8}$ in. long; the limb 4-lobed, hairy outside above, scarcely bilabiate; the lobes $\frac{1}{18}$ to $\frac{1}{15}$ in. long; stamens not exserted; style exserted.

Pungo Andongo.—At Lombe; in fl. No. **5550**.

4. **A. cylindraceus** Oliv. in Trans. Linn. Soc. xxix. p. 135, t. 132 (1875).

A. villosus T. Thoms. in Speke, Journ., App. p. 644 (1863); non Benth.

Huilla.—Flowers whitish; fruit clear blue. In thickets close to the Humpata river among species of *Polygonum* (cf. Welw. herb. no. 5362) and *Salix* (cf. Welw. herb. no. 6332), etc.; fl. and fr. April 1860. No. **5611**.

5. **A. succisifolius** Baker ms. in Herb. Kew.

A perennial herb, 8 to 16 in. high; rhizome tuberous, many-headed; the tuber as large as a walnut, densely packed with a white flesh which becomes woody; stems erect, obtusely quadrangular, furrowed, puberulous and remotely leafy above, glabrescent and leafy at the base; leaves opposite, narrowly elliptical or sublinear, rather bluntly pointed at the apex, attenuate at the base into the petiole, glabrous or nearly so, erect or ascending, serrulate or repand on the margin, the lower ones 3 to 8 in. long (including the petiole of 1 to 3 in.) by $\frac{1}{5}$ to $\frac{1}{2}$ in. broad, the upper ones smaller; flowers capitate, bracteate, white or soon turning dusky, numerous, $\frac{1}{4}$ in. long; heads sub-hemispherical, $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter, pedunculate, not numerous, arranged in lax terminal corymbs; peduncles of the heads ranging up to $3\frac{1}{2}$ in. long, shortly pubescent, terminal and sub-terminal, sometimes with foliaceous bracts at their apex; bracts among or at the base of the flowers broadly rhomboidal, densely shaggy on the base, glabrous on the face, $\frac{1}{8}$ in. long and broad; calyx $\frac{1}{16}$ in. long, densely shaggy outside at least below, smooth inside, bilobed; the lobes rounded, ciliate; corolla bilabiate; the

tube $\frac{1}{6}$ in. long, glabrous or nearly so, about $\frac{1}{16}$ in. broad; the lips spreading, more or less shaggy outside at the apex with long hairs; the longer lip about $\frac{1}{15}$ in. long, bifid; the shorter lip about $\frac{1}{20}$ in. long, tripartite; the lobes obtuse; stamens 4, subdidynamous, declinate, all exceeding the corolla-tube; style exserted.

Huilla.—In the more elevated rich pastures of Mumpulla; fl. Oct. 1859. No. **5610**. In thickets at the river Monino; fl. Nov. 1859. No. **5609**. In somewhat dry and also in moist elevated pastures between Lopollo and Humpata, at an elevation of 5200 to 5600 ft.; in fl. Feb. 1860, and without good fr. in April 1860. No. **5608**.

6. **A. Welwitschii** Briq., *l.c.*, p. 169.

Pungo Andongo.—A herb, 3 ft. high, biennial or with a woody rootstock lasting for 3 or 4 years; corolla lilac; the tube short, nearly straight; the upper lip trifid, erect, with obtuse lobes; the lower lip elliptical, concave; stamens ascending; nucules 4, globose, glabrous. At the great cataract of the river Cuanza; fl. and fr. 12 March 1857. No. **5549**.

7. **A. minor** Briq., *l.c.*, p. 169.

Huilla.—Flowers whitish violet in colour. In the Monino sandy wooded meadows; fl. Feb. 1860. No. **5605**. In the Monino forest meadows, in the Lopollo country; fl. April 1860. No. **5606**. In the Catumba damp wooded meadows; fl. and fr. Feb. 1860. A state with leafy radical shoots, showing elongated foliage larger than that of the flowering stems. No. **5607**.

8. **A. sericeus** Briq., *l.c.*, p. 170.

Huilla.—In the Monino forest meadows; fl. and fr. Feb. 1860. No. **5603**. A smaller, less silky plant, probably of this species. In fl. No. **5604**.

Var. **teucrioides**.

A perennial herb, with the habit of a *Teucrium*, sparingly aromatic; stems numerous, usually suffrutescent, about 3 ft. high; leaves ranging up to $3\frac{1}{2}$ in. long by $\frac{1}{2}$ in. broad; flowers violet in colour; flower-heads rather densely arranged in a terminal somewhat leafy ovoid panicle.

Pungo Andongo.—In the wooded thickets of Sobato Quibanga and near Quilanga, plentiful; fl. end of April 1857. No. **5551**.

This variety should be compared with *A. Heudelotii* Briq. in Bull. Herb. Boiss. ii. p. 689 (Dec. 1894), but the heads are smaller.

6. **BASILICUM** Moench, Meth. Pl., Suppl. p. 143 (1802).

Lumnitzera Jacq. ex Sprengl. Syst. Veg. ii. p. 687 (1825) *p.p.*; non Willd. (1803). *Moschosma* Reichenb. Conspect. p. 171 (1828); Benth. & Hook. f. Gen. Pl. ii. p. 1173.

1. **B. polystachion** Moench, *l.c.*

Ocimum tenuiflorum Burm. Fl. Ind. p. 129 (1768), non L. (1753). *O. polystachyon* L. Mant. ii. p. 567 (1771). *Moschosma polystachya* Reichenb. in Wall. List, p. 92, n. 2711 (1830 ?); Benth. in Wall. Pl. As. Rar. ii. p. 13 (1831).

Ambriz.—In fr. Nov. 1853. No. **5547** partly.

Barra do Bengo.—At Quifandongo fl. and fr. Dec. 1853. No. **5547**, partly. In damp places at the river Bengo, near Quifandongo; fr. May 1854. Coll. Carp. 856.

Loanda.—An annual herb, but little aromatic, 1 to 3 ft. high; primary stem purplish; angles of the stem and branches constantly and coarsely muricate; flowers small, violet-purple; calyx bilabiate, the top tooth evidently decurrent on the margins, the lower teeth lanceolate-acuminate, not setaceous; lower corolla-lip reflected; nucules almost ellipsoidal, scarcely ovoid-compressed, somewhat smooth. In damp sandy places by ponds, not uncommon; near Imbondeiro dos Lobos; fl. and fr. 26 March 1858. No. **5582** and Coll. Carp. 854.

2. **B. myriostachyum** O. Kuntze, Rev. Gen. Pl. ii. p. 512 (1891).

Moschosma myriostachya Benth. in Benth. & Hook. f. Gen. Pl. ii. p. 1173.

Mossamedes.—An annual or biennial herb, branched from the base, stems oblique or ascending; leaves ovate, obtuse at the apex, more or less cordate at the base, sprinkled on both faces with short stiff hairs and small glands, somewhat spotted, very brittle, crenate, 1 to $2\frac{3}{4}$ in. long by $\frac{3}{4}$ to 2 in. broad; petiole $\frac{1}{2}$ to 1 in. long, hairy; flowers diœcious, on very short pedicels, small, arranged in spikelike racemes of $\frac{1}{2}$ to 1 in. long which form pyramidal panicles terminating the stem and upper branches, soft, quite white, making the plant when in flower look as if covered with snow; the male spikes rather dense, the female ones very dense; calyx purplish; stamens 4, didynamous, exserted; style bifid, exserted. At the sandy banks of the river Bero, near Cavalheiros, very rare; male fl. July 1859. No. **5476**.

Bumbo.—At Bumbo; female fl. Oct. 1859, one specimen. No. **5477**.

7. **ORTHOSIPHON** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 1174.

1. **O. tuberosus** Briq. in Engl. Bot. Jahrb. xix. p. 172 (21 Aug. 1894).

Huilla.—Flowers rosy purple. In the drier pastures among low bushes, near Lopollo; fl. and fr. Jan. 1860. No. **5474**. A perennial herb, 5 to 7 in. high; rootstock tuberculose-filipendulous; stems numerous. In thickets on the high plateau of Huilla about Lopollo, at an elevation of 5000 to 5600 ft., not uncommon; fl. and fr. May 1860. No. **5497**.

2. **O. tubulascens** Briq., *l.c.*, p. 174.

Huilla.—Flowers rosy purple. In very elevated sandy meadows among low herbs, in Morro de Lopollo (Sambos); fl. and fr. Jan. and Feb. 1860. No. **5492**.

3. **O. menthæfolius** Briq., *l.c.*, p. 176.

Huilla.—A slightly aromatic, perennial herb; rootstock woody, filipendulous; stems several, erect, branched at the apex; flowers white; corolla shaggy; nucules obovoid, truncate at the apex; filaments hirsute. In moist thickets close to the Lopollo river, plentiful; fl. and fr. 8 Feb. 1860. No. **5475**.

4. **O. Welwitschii** Rolfe in Bol. Soc. Brot. xi. p. 88 (1894).

O. adornatus Briq., *l.c.*, p. 176 (21 Aug. 1894).

With regard to the question of priority between these two names it may be observed that Rolfe's paper was noticed in Bot.

Zeit. lii. p. 285 (16 Sept. 1894), and that Briquet's paper was noticed, *l.c.*, p. 382 (16 Dec. 1894).

Pungo Andongo.—A decumbent undershrub ; branches ascending, often abortive ; flowers bright, from whitish to rosy ; bracts deep rosy purple, before the opening of the flowers forming compact rosy foliate spikes. In the open sandy forest near Cazella, fairly plentiful but only in one spot ; fl. and fr. 18 Oct. 1856. No. **5555**.

Var. **angolensis** (Briq., *l.c.*).

Huilla.—In the poor sandy pastures of Mumpulla · fl. and fr. Oct. 1859. No. **5520**. Flowers rosy, shining. In rocky pastures among low bushes ; fl. Dec. 1859 ; also on the heights near Ferrão da Sola in the Lopollo country ; fl. and fr. Jan. 1860. No. **5519**.

The local name of this species in Malange is "Caboboato" ; *see* Henriques, Bol. Soc. Brot. xvi. p. 70 (July 1899).

5. **O. villosus** Briq., *l.c.*, p. 177.

Huilla.—A herb, with a woody rootstock, giving off long filipendulous fibres ; stems numerous, 5 to 14 in. high, erect ; leaves deep green ; flowers white. In secondary thickets about Lopollo, on a sandy clay soil ; fl. Jan. 1860. No. **5472**.

6. **O. violaceus** Briq., *l.c.*, p. 178.

Huilla.—A perennial herb, with the habit of a *Prunella* ; rhizome tuberous-filipendulous ; stems prostrate-ascending ; calyx purple ; corolla whitish purple : filaments short, not appendaged. In rocky thickets among short grasses, in company with species of Thymelæaceæ and Euphorbiaceæ, in the Lopollo country, and seen nowhere else ; fl. Dec. 1859. No. **5473**.

7. **O. petrensis** Hiern, sp. n.

An erect, rigid, pubescent herb, 1 to $1\frac{1}{2}$ ft. high ; rootstock woody ; stems several, erect or ascending, simple or not much branched, obtusely quadrangular and furrowed at least above, leafy in the middle part ; leaves opposite, narrowly elliptical or obovate-oblong, obtuse or subacute at the apex, attenuate to the sessile or subsessile base, firmly herbaceous, yellowish green and sparingly hairy above, paler subcanescent and rather densely pubescent beneath, minutely glandular, serrulate, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{1}{2}$ in. broad ; inflorescence terminal, in simple or somewhat branched spikes, loosely pubescent, 4 to $7\frac{1}{2}$ in. long ; venation not strongly marked nor much branched ; verticils distant, about 6 in each spike, bracteate at the base, each of them about 4- to 6-flowered ; bracts small, ovate, caducous ; pedicels $\frac{1}{12}$ to $\frac{1}{6}$ in. long ; flowers whitish rosy, about $\frac{1}{2}$ in. long or rather more, spreading or drooping ; calyx $\frac{1}{5}$ to $\frac{1}{4}$ in. long, hairy outside, oblong, somewhat gibbous at the base, shortly 5-cleft, the throat glabrous ; the posterior lobe ciliate, rounded, $\frac{1}{16}$ in. long in flower, $\frac{1}{8}$ in. long in fruit, usually purplish ; the other lobes subulate from a comparatively broad base, ciliate, rather longer than the posterior lobe ; corolla $\frac{3}{8}$ to $\frac{2}{5}$ in. long ; the tube about $\frac{1}{5}$ in. long, straight or nearly so ; the limb bilabiate ; the anterior lip about $\frac{1}{8}$ in. long, spreading ; the posterior lip short ; stamens 4, didynamous, nearly glabrous ; filaments of one pair

lying closely together; anthers exserted; style exserted, nearly glabrous, somewhat thickened towards the emarginate apex.

Huilla.—In rocky thickets near Lopollo, not common; fl. and fr. Jan. 1860. No. **5494**.

8. **O. parvifolius** Vatke in Linnæa xliii. p. 87 (1881).

Pungo Andongo.—An erect, perennial herb, 1½ ft. high; roots filipendulous-tuberous; flowers white. In a sandy place near the outskirts of the forest between Cazella and Luxillo, very rare; fl.-bud 18 Oct. 1856. No. **1226**.

This determination is uncertain in consequence of the young state of the flower-buds and the poor condition of the specimens which were collected by night; the leaves do not show the small distant teeth of the type.

8. **ENGLERASTRUM** Briq. in Engl. Bot. Jahrb. xix. p. 178 (21 Aug. 1894).

1. **E. Schweinfurthii** Briq., *l.c.*, t. 3 A.

Pungo Andongo.—An annual herb, ascending or pendulous over rocks; flowers violet in colour. By the rocks close to the great cataract of the river Cuanza, near Condo; fl. March 1857. No. **5522**.

9. **HOSLUNDIA** Thonn. ex Vahl; Benth. & Hook. f. Gen. Pl. ii. p. 1174.

Haaslundia Vahl. ex Hornem. Indol. Pl. Guin. Obs. p. 14 (1819).

1. **H. verticillata** Vahl, Enum. Pl. i. p. 213 (1804).

Ambriz.—In thickets near Ambriz; fl. and young fr. Nov. 1853. No. **5674**.

Loanda.—A small shrub, 3 to 4 ft. high, flowering at all times of the year; stem erect, branched, angular, whitish; leaves opposite or ternate, very caducous; flowers whitish; drupes coloured like red-lead, juicy, a little smaller than peppercorns. In moist bushy places near Imbondeiro dos Lobos, sparingly; fl. and fr. June 1858. Nos. **5719**, **5669**, **5673**.

Var. ? **decumbens**.

H. decumbens Benth. in DC. Prodr. xii. p. 54 (1848).

Golungo Alto.—A shrub, 3 to 6 ft. high, in flower at all seasons; stem ternately or brachiately branched; leaves soft, ashy, loosely pendulous; calyx 5-toothed, after the fertilization of the flower fleshy, swelled; corolla white, ringent; stamens 4, didynamous, only 2 fertile; ovary 4-ovulate; style slightly curved; stigma somewhat bilobed; berry like a small pea in size, beautiful, like red-lead in colour, included in the calyx, tipped with the calyx-teeth which are united in a cone; nucules obovoid, pale-dusky, 4 or by abortion 3 or 2. In bushy places chiefly in the rocky and more elevated localities about Sange, Trombeta, etc., plentiful; fl. and fr. 14 Oct. 1855. No. **5672**.

Pungo Andongo.—A shrub, with white flowers and scarlet or red berries. In the thickets of the præsidium, rather rare; fl. and fr. Jan. 1857. No. **5718**.

10. **GERMANEA** Lam. Encycl. Meth. ii. p. 690 (1786).

Plectranthus L'Hérit. Stirpes Novæ, fasc. 4, p. 84 (back) (1788); Benth. & Hook. f. Gen. Pl. ii. p. 1175.

1. **G. cylindracea.**

Plectranthus cylindraceus Hochst. in Pl. Schimp. Abyss. ii. n. 1113 (*U.i.*, 1842); Benth. in DC. Prodr. xii. p. 60 (1848); A. Rich. Fl. Abyss. ii. p. 182 (1851). *Geniosporum lasiostachyum* Briq. in Engl. Bot. Jahrb. xix. p. 164 (1894).

Huilla.—A fleshy shrub or robust herb, the whole plant especially the leaves very agreeably aromatic; the aroma like those of marjoram and mint mixed; stems numerous, some 5 to 6 ft. high with sarmentose subscandent branches; others short, with decumbent branches; leaves very brittle, somewhat fleshy and rigid; flowers white, small, bilabiate. In rocky, wooded places in Morro de Lopollo, plentiful; fl. April 1860. No. **5489**.

2. **G. herbacea.**

Plectranthus herbaceus Briq., *l.c.*, p. 179.

Huilla.—An annual, erect, branched herb, smelling like mint; stem acutely quadrangular; leaves ovate, somewhat fleshy, soft, coarsely crenate-dentate, beneath mostly purplish and with raised nerves and net-veins, punctate; flowers white; upper calyx-lobe broadly ovate, the limb at length reflected; corolla comparatively small, the tube sigmoid, the upper lip 4-lobed, and marked with a few purple lines, the lower lip boat-shaped; anthers 1-celled; style simple; stigma somewhat bilobed, papillose. In damp forests at Catumba in the Lopollo country, rather rare; fl. and fr. 29 March 1860. No. **5506**. An undershrub with quadrangular stem and purple flowers. In the Monino wooded thickets, rare; fl. and fr. April 1860. Only one mutilated specimen, probably of this species. No. **5614**.

3. **G. laxiflora.**

Plectranthus laxiflorus Benth. in E. Mey. Comm. Pl. Austr. Afr. p. 228 (1837).

Var. **genuina** (Briq., *l.c.*, p. 180).

Pungo Andongo.—An erect branched perennial herb, 2 to 4 ft. high; aroma precisely like that of Elemi-Mubafo (cf. *Canarium edule* Hook. f., *ante* p. 127) but sweeter and more penetrating; stem obtusely quadrangular, a little swelled below the nodes, at length constricted at the nodes, beset on all sides as well as the leaves with long glandless hairs and also with shorter glandular ones; corolla pale clear blue, the upper lateral lobes of the lip involute; anthers blackish purple; style bifid at the apex. At the rocky banks of the river Casalalé, in the præsidium; fl. end of Feb. 1857. Leaves succulent-membranous, bright green, fragrant when rubbed. In moist thickets at the Songue rocks; without fl. middle of Jan. 1857. No. **5545**. In the rocky thickets of the præsidium; fl. and fr. April 1857. Coll. Carp. 855.

4. **G. concinna** Hiern, sp. n.

An annual, erect, slender herb, 9 to 24 in. high; stem a little branched, puberulous below, usually hirsute above with spreading long hairs mixed with short ones and minute glands; leaves opposite, deltoid-ovate, obtuse or scarcely acute at the apex, subtruncate or somewhat cordate near the shortly narrowed base, membranous, minutely punctate, thinly hairy above, more densely so and paler beneath, crenate, 1 to 3 in. long by $\frac{2}{3}$ to $2\frac{1}{4}$ in. broad; petioles ranging up to 2 in. long, more or less shortly hairy and also hirsute with long spreading hairs; the leaves at the base of

the inflorescence sometimes sessile or subsessile; flowers white or deep blue, $\frac{1}{3}$ to $\frac{3}{8}$ in. long; inflorescence terminal and in some cases axillary also, rather lax and usually many-flowered, narrowly pyramidal, more or less compound, cymose; cymes not verticillate; ultimate pedicels ranging up to $\frac{1}{8}$ or $\frac{1}{6}$ in. long, puberulous and minutely glandular; flowering calyx very small, $\frac{1}{20}$ in. long, glandular, shortly 5-lobed, one lobe broad, the other lobes narrower; fruiting calyx $\frac{1}{8}$ to $\frac{1}{6}$ in. long, punctate with scattered black glands, one lobe rotund and veiny, the other lobes lanceolate and short; corolla thin, glabrous, black-punctate, bent in a sigmoid manner; stamens 4, didynamous, all fertile; filaments apparently free to the base, inserted high up on the corolla-tube, tapering upwards, not toothed; stigma shortly exserted, entire, somewhat thickened at the apex.

Pungo Andongo.—In Mata de Pungo; fl. and fr. April 1857. No. **5533.**

Var. **cærulea.**

About 9 in. high; flowers deep blue.

Pungo Andongo.—By streams in the more elevated rocky parts of the præsidium, sparingly; fl. Dec. 1856. No. **5521.**

Var. **albiflora.**

A slender limp herb, 1 to $1\frac{1}{2}$ ft. high; flowers white.

Pungo Andongo.—In sandy places between Luxillo and Cazella, in tall grass; fl. beginning of May 1857. No. **5586** partly.

The last variety bears a close resemblance to *P. parvus* Oliv., a Somali-land species, but the calyx slightly differs and the corolla is smaller in the latter. Part of No. 5586 consists of flowerless specimens apparently of a different species.

5. **G. andongensis** Hiern, sp. n.

An erect, apparently perennial herb; rootstock somewhat woody; stem simple or nearly so, puberulous, striate; internodes mostly 2 to 4 in. long; leaves ovate, narrowed or subacuminate towards the obtuse tip, more or less attenuate at the base, slightly puberulous, thinly herbaceous, black, punctulate beneath, crenate except near the base, 2 to $3\frac{1}{2}$ in. long by $\frac{5}{6}$ to $1\frac{2}{5}$ in. broad; lateral veins 3 or 4 on each side of the midrib, ascending, slender, the lower ones with inflected curvature about their middle; petioles ranging up to $\frac{2}{3}$ in. long, the uppermost ones much shorter; inflorescence terminal, somewhat oblong in outline, compound, cymose, many-flowered, rather lax, about 6 in. long and an inch in diameter, puberulous; common peduncle about an inch long, bibracteate at the base, the bracts foliaceous, about $\frac{3}{8}$ in. long, sessile; ultimately pedicels ranging up to about $\frac{1}{8}$ in. long; flowers about $\frac{1}{3}$ in. long; calyx $\frac{1}{12}$ in. long, glandular-puberulous, 5-cleft, the posterior lobe the broadest, the lateral lobes the smallest, the anterior lobes united to near the apex; corolla exserted, curved in a sigmoid manner, glabrous; the tube bent forwards at the middle; the limb bilabiate, nigro-punctulate; the anterior limb broad, folded inwards along its concave axis, $\frac{1}{6}$ in. long; the

posterior lip much smaller; stamens 4, didynamous, declinate, included, glabrous; the filaments rather slender, free to their base, inserted at the top of the corolla tube; style glabrous, shortly exserted, rather slender, entire at the apex.

Pungo Andongo.—In fl. No. **5543**.

This is nearly related to *G. concinna*; it was collected in the latter part of 1856 or the early part of 1857.

6. **G. horrida.**

An ascending herb, $1\frac{1}{2}$ to 2 ft. high, beset with pilose hairs, perennial or sub-perennial; stem densely hispid-shaggy, simple or not much branched up to the inflorescence; leaves opposite deltoid-ovate, obtuse at the apex, subtruncate or very obtuse at or near the base, herbaceous, somewhat fleshy, grey-green at least beneath, coarsely dentate, 1 to $2\frac{3}{4}$ in. long by $\frac{5}{6}$ to 2 in. broad; petioles $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, beset with long spreading pilose hairs, often with stipuliform small leaves in their axils; flowers blue or purplish blue, $\frac{3}{8}$ to $\frac{2}{5}$ in. long, rather slender, on puberulous slender pedicels of $\frac{1}{8}$ to $\frac{1}{6}$ in. long, about 4 to 6 in a whorl; whorls leafless arranged in terminal spikes, the upper ones approximated, the lower ones less so or rather distant; spikes shortly pedunculate, about 7 to 9 in. long, with a few opposite shorter branches near the base; calyx obliquely sub-hemispherical, $\frac{1}{15}$ to $\frac{1}{10}$ in. long, sparingly hispidulous outside, 5-cleft, the posterior lobe ovate, scarcely longer than the subulate other lobes; corolla nearly glabrous, bilabiate, glandular about the apex in bud; the anterior lip much longer than the lower one; the tube $\frac{1}{8}$ to $\frac{1}{6}$ in. long, narrow, funnel-shaped; stamens 4, declinate, all fertile; the filaments free to their base; style bifid at the apex.

Pungo Andongo.—In swampy rocky places in the præsidium; without fl. or fr. Jan. 1857; by rocks at the great cataract of the river Cuanza, near Condo; fl. March 1857. No. **5537**.

Huilla.—In the more elevated rocky parts of Morro de Monino; fl. beginning of April 1860. No. **5613**.

This species has the aspect of the Somali-land *G. rupestris* (Benth. ex Vatke in Linnæa xliii. p. 89 [1881]), but it differs in the herbaceous rather than suffruticose habit; spikes somewhat branched at the base, etc.

11. **SOLENOSTEMON** Thonn.; Benth. & Hook. f. Gen. Pl. ii. p. 1175.

1. **S. ocymoides** Schum. & Thonn. in Danske Vid. Selsk. iv. p. 45 (1829).

Sierra Leone.—A somewhat pubescent herb; stem and branches quadrangular, pubescent along the angles, furrowed; leaves opposite, roundly ovate, shortly acuminate at the apex, subtruncate or subcordate about the base, sub-decurrent on the petiole, thinly herbaceous, puberulous, minutely punctulate, crenate except towards the base, $2\frac{1}{2}$ to 3 in. long by 2 to $2\frac{1}{2}$ in. broad; venation slender, puberulous beneath; petiole 1 to $1\frac{1}{4}$ in. long; inflorescence spike-like, terminal, dense, 3 to 4 in. long; verticils many-flowered, approximate; pedicels spreading, shortly pubescent, $\frac{1}{8}$ in. long or shorter; flowers small:

bracts ovate, small; calyx $\frac{1}{15}$ to $\frac{1}{10}$ in. long in flower, $\frac{1}{8}$ to $\frac{1}{5}$ in. long in fruit, bilabiate, minutely glandular-puberulous; the lips entire or the upper lip with a minute tooth on each side, erect or nearly so, obtuse, veiny in fruit; corolla $\frac{1}{10}$ to $\frac{1}{8}$ in. long, sigmoidly curved; the tube twice bent; the limb bilabiate; the larger lobe $\frac{1}{12}$ in. long, directed forwards, boat-shaped, covering the stamens; the smaller lobe $\frac{1}{20}$ to $\frac{1}{16}$ in. long, below and sub-parallel to the other lip; stamens 4, sub-didynamous, about $\frac{1}{16}$ in. long, glabrous, included; filaments free among themselves for the greater part of their length, united in a short tube below, the tube inserted at the top of the corolla-tube; style rather longer than the stamens, included, glabrous, bent and bifid at the apex; nutlets 4, ellipsoidal, glabrous, pale yellow; fl. and fr. Sept. 1853. The inflorescence is denser than in the type. No. **5580**.

No. **5579** from PRINCE'S ISLAND, wooded coast region, Sept. 1853, consists of a few flowers and fruits, possibly belonging here and perhaps identical with an unnamed specimen obtained from the Congo by Christian Smith in 1816. Cf. *Labiata*, Welw. in Ann. Cons. Ultramar. Lisb. No. 7 (August 1854), p. 80. n. 11.

2. **S. robustus** Hiern, sp. n.

A robust herb, several feet high; stem and branches obtusely quadrangular, furrowed, more or less puberulous and minutely glandular; branchlets pallid, clothed with short whitish hairs and small red glands; leaves opposite, oval or ovate-oblong, obtuse at the apex, obtuse or somewhat narrowed at the base, firmly herbaceous, pale yellowish green, minutely glandular-punctulate, subglabrescent, crenulate, $2\frac{1}{2}$ to $5\frac{1}{2}$ in. long by $1\frac{1}{4}$ to $3\frac{3}{4}$ in. broad; lateral veins 6 to 8 on each side of the midrib, spreading, slender; petioles $\frac{1}{3}$ to $1\frac{1}{8}$ in. long, shortly hairy; flowers about $\frac{1}{2}$ in. long on rather slender hispidulous pedicels ranging up to $\frac{2}{3}$ in. long, clustered; cymes sessile, opposite or alternate, arranged in spikes or divaricately branched terminal pyramidal panicles more than a foot long; calyx $\frac{1}{5}$ in. long, hairy outside, glabrous inside, openly campanulate, 5-cleft; the lobes deltoid-ovate, one somewhat broader and more spreading than the rest; corolla minutely glandular outside, membranous; its tube bent near the base, $\frac{1}{6}$ in. long; the limb bilabiate; the smaller lip spreading, 4-cleft, concave-induplicate, the middle lobes the largest; the larger lip nearly $\frac{1}{2}$ in. long, bent inwards at about a right angle or more so near the base, sparingly pubescent outside, concave-induplicate, enclosing the androecium; stamens 4, didynamous; filaments united from the base for some distance into a glabrous tube slit down one side; style long, slender, glabrous, slightly notched at the apex.

PUNGO ANDONGO.—From Lombe to Condo; fl. March 1857. No. **5538**.

3. **S. niveus** Hiern, sp. n.

A rigid, erect shrub, 3 to 4 ft. high, sparingly and loosely branched; stem somewhat fleshy; branches erect-spreading, naked below; subterete, softly pubescent near the apex; leaves opposite, suborbicular, shortly and abruptly narrowed at the base, somewhat thick, almost fleshy, deep green, puberulous, minutely glandular, crenate-dentate, 2 to 4 in. in diameter or rather larger,

quickly falling off in the course of drying; petiole $\frac{1}{4}$ to 1 in. long; flowers snow-white, about $\frac{1}{2}$ in. long, clustered several together on pubescent pedicels of $\frac{1}{8}$ to $\frac{1}{3}$ in. long, in subsessile or shortly stalked crowded cymes, arranged in oblong terminal and subterminal thyrsoid snow-white panicles $2\frac{1}{2}$ to 12 in. long; calyx hairy outside, glabrous inside, openly campanulate, $\frac{1}{6}$ in. long in flower, $\frac{3}{8}$ in. long in fruit, unequally 5-cleft; four of the lobes narrowly lanceolate, $\frac{1}{12}$ to $\frac{1}{10}$ in. long; the fifth lobe oval, $\frac{1}{8}$ in. long; corolla sigmoidly curved; the tube twice bent, $\frac{1}{10}$ in. high; the limb minutely glandular outside, the longer lip covering the androecium; stamens 4, didynamous; the filaments united at the base into a short tube slit down one side; style long, exserted, bifid at the apex, the branches short and narrow; ripe nutlets nearly black.

Bumbo.—In the wooded more elevated parts of Serra da Xella by streams, above Chão de Xella, very rare; fl. and fr. Oct. 1859. No. **5619**, and Coll. Carp. 858.

12. **NEOMÜLLERA** Briq. in Engl. Bot. Jahrb. xix. p. 186 (21 Aug. 1894).

1. **N. Welwitschii** Briq., *l.c.*, t. 3. fig. B.

N. angolensis Briq. in Engl. Nat. Pflanzenfam. iv. 3*a*, p. 363 (1897).

Pungo Andongo.—An annual or biennial herb, 2 to 4 ft. high; stem juicy, acutely quadrangular, with the angles feebly winged; leaves not scented; petioles deeply channelled, acutely keeled; flowers pleasantly fragrant, very beautifully blue; calyx 5-toothed, the topmost tooth much larger and longer than the rest; upper corolla-lip shortly bilobed, the lobes obtusely unidentate on the outer side; stamens 4, all fertile, the filaments strictly monadelphous from the base to the middle, the anthers dehiscing transversely, the cells confluent; nutlets obovoid, somewhat compressed, quite naked. In the bushy wooded parts of Mata de Pungo in the præsidium, plentiful; fl. 14 April 1857. No. **5544**.

13. **COLEUS** Lour.; Benth. & Hook. f. Gen. Pl. ii. p. 1176.

1. **C. Welwitschii** Briq. in Engl. Bot. Jahrb. xix. p. 185 (1894), and in Engl. Nat. Pflanzenfam. iv. 3*a*, p. 361 (1897).

Pungo Andongo.—A suffruticose herb or a somewhat thickly fleshy brittle shrublet; stems ascending, blood-red, 2 to 4 ft. high; leaves membranous, somewhat fleshy and viscid, deep green, densely hairy beneath; flowers purple or deep or clear blue; calyx-teeth 4, the lower one shortly bilobed at the apex, the lobes acute. In rocky thickets throughout the district, plentiful; fl. and fr. Feb. 1857; fl. April 1857; by the elevated rocks of Pedra Cabonda in the præsidium, fl. May 1857. Nos. **5589**, **5585**.

Aspect of *Plectranthus hirtus* Benth.

2. **C. amboinicus** Lour. Fl. Cochinch. p. 372 (1790).

Var. **violaceus** Gürke in Engl. Bot. Jahrb. xix. p. 210 (21 Aug. 1894).

Loanda.—A decumbent or ascending undershrub, with somewhat erect branches; stem and leaves clothed with long and short hairs

intermixed; leaves broadly ovate, scarcely acuminate at the apex, cordate-truncate and often abruptly narrowed at the base, crenate-dentate, very rigidly fleshy, agreeably fragrant; flowers violet-blue; calyx glandular-shaggy outside, apparently naked at the throat inside; corolla-tube whitish, twice bent at a right angle; the upper lip vertical, emarginate at the apex, unidentate on each side, obscurely 4-lobed; the lower lip horizontal, broadly boat-shaped; stamens far exserted, with the filaments monadelphous to a considerable height; style reaching to the height of the stamens and ascending with them; stigma bifid, with equal lobes. Cultivated in gardens at Loanda, where however it rarely flowers; fl. Nov. 1858. According to Welwitsch, this is perhaps a mint introduced from India. No. **5556**.

This is probably the kitchen-garden plant referred to in the following terms by Welwitsch in Ann. Cons. Ultramar. No. 24 (May 1856), p. 252. n. 20:—

It is very aromatic, called "hortelã da India" (Indian Mint), and cultivated by lovers of herbs; the leaves are very fleshy and brittle, and the strong aroma is pleasant in broth.

3. **C. aconitiflorus** Welw. ms. in Herb., sp. n.

An erect, rather slender, sparingly branched or simple herb, 3 to 4 ft. high; stem quadrangular, minutely glandular, more or less pubescent; leaves ovate-lanceolate, coarsely toothed, puberulous, acuminate at the apex, narrowed towards the base, thinly herbaceous, 2 to 4 in. long by $\frac{1}{2}$ to $1\frac{1}{2}$ in. broad; petiole $\frac{5}{8}$ to $1\frac{1}{2}$ in. long; flowers arranged in long somewhat compound racemes terminating the stem and branches, deep blue, about $\frac{1}{8}$ in. long, resembling a small-flowered species of *Aconitum*; calyx puberulous, $\frac{1}{12}$ in. long, 5-cleft, the lobes not very unequal; corolla-tube puberulous, curved in a sigmoid manner, the throat wide; the limb minutely glandular, bilabiate; the upper lip erect and 4-lobed, the upper lobes larger than the others; the lower lip deflected-ascending, boat-shaped, compressed, embracing the genital organs, quasi-articulate; stamens 4, monadelphous in a short sheath, including the style at the base; anthers ovate-circular, the cells confluent; style filiform, simple, not bifid; stigma very delicately papillose, slightly emarginate or bilobulate at the apex.

Huilla.—In moist wooded places near Catumba; fl. 29 March 1860. No. **5495**.

4. **C. betonicoides** Baker ms. in Herb., sp. n.

An erect or ascending herb; rootstock somewhat woody; stems shortly pubescent, sulcate, scarcely or not much branched, 18 to 20 in. high, leaves opposite ternate or quaternate, oval or ovate, obtuse at the apex, more or less attenuate at the base into and decurrent on the petiole, thinly herbaceous, shortly pubescent above, densely so beneath, crenate-dentate except near the base, 1 to 2 in. long by $\frac{2}{3}$ to $1\frac{1}{3}$ in. broad; lateral veins about 4 on each side of the midrib, ascending, slender; petiole shortly pubescent, $\frac{1}{3}$ to $1\frac{1}{3}$ in. long; inflorescence terminal, spiciform, 4 to 8 in. long, interrupted below; common peduncle about an inch long; verticils

many-flowered, numerous, the lower ones more or less distant, the upper ones contiguous; axillary cymes sessile or subsessile; pedicels about $\frac{1}{8}$ in. long, shortly pubescent; flowers purplish, verging on blue, $\frac{3}{8}$ in. long; calyx about $\frac{1}{20}$ in. high in flower, $\frac{1}{5}$ in. long in fruit, spreading or turning downwards in fruit; the tube pubescent; the limb bilabiate, spreading; one lobe broad and larger than the rest, about $\frac{1}{20}$ in. long in the flower and $\frac{1}{8}$ in. long in fruit; throat naked; corolla curved in a sigmoid manner, subglabrous, slightly puberulous outside with short scattered hairs, bilabiate; the lips nigro-punctulate; the larger lip $\frac{1}{4}$ in. long, bent at a right angle at the base, concave-conduplicate, enclosing the andrœcium; stamens 4, didynamous; filaments united at the base into a short tube; style slightly thickened at the apex; nutlets yellowish, glabrous, ovoid, $\frac{1}{20}$ in. long.

Huilla.—In herbaceous places close to the banks of the Lopollo stream at Ferrão da Sola; fl. and fr. end of Jan. 1860. No. **5612.**

14. **SYMPHOSTEMON** Welw. ms. in Herb., gen. nov.

Calyx at the time of flowering obliquely campanulate, gibbous at the back of the base, 5-cleft, sub-bilabiate, in fruit somewhat increased and usually pendulous; the teeth unequal, the posterior tooth broadly ovate and obtuse or apiculate, the other teeth narrower and acute; corolla-tube exserted, shortly tubular-funnel-shaped, not sigmoid, a little curved and gibbous at the back near the base; the throat wide, scarcely oblique; the limb bilabiate, the posterior lip shortly 4-lobed, the anterior one longer entire boat-shaped and laterally embracing the genital organs; stamens 4, didynamous, declinate, all fertile, falling a little short of the anterior corolla-lip; filaments widening at the base and united in a short flat lamina inserted on the corolla-throat at the base of the anterior lip; anthers roundish, the cells confluent; disk fleshy, produced into 4 thick obovoid glands beside the base of the nutlets; ovary 4-partite; style shortly exceeding the corolla-tube, nearly entire; stigma emarginate at the apex; nutlets compressed, obovoid.

A nearly glabrous minutely glandular herb; leaves opposite, sub-opposite, sub-ternate, and sub-alternate; racemes terminal; pedicels alternate opposite and sub-ternate, bracteate at or near the base, spreading.

1. **S. insolitus.**

Plectranthus insolitus C. H. Wright in Journ. Linn. Soc. xxxiv. p. 275, t. 6, figs. 7 & 8 (July 1899).

Perennial, 6 to 12 in. high, very elegant; rootstock tuberous, large, fleshy; stems several, erect or ascending, simple or branched near the base, rigid; leaves sub-linear, narrowed at both ends, herbaceous-green, somewhat rigid, entire or pauci-denticulate, sessile, $\frac{3}{4}$ to 2 in. long by $\frac{1}{12}$ to $\frac{1}{6}$ in. broad; inflorescence 2 to 6 in. long; lower pedicels about $\frac{1}{2}$ in. long; bracts ranging up to $\frac{1}{4}$ in. long; flowers $\frac{1}{4}$ to $\frac{3}{8}$ in. long, clear blue, glandular; calyx glandular, $\frac{1}{8}$ to $\frac{1}{5}$ in. long; style $\frac{1}{4}$ in. long.

Huilla.—In hilly bushy sandy and rocky places about Lopollo, towards the east, plentiful; fl. and fr. Dec. 1859 to Feb. 1860. Nos. **1634**, **5593**.

15. **ÆOLANTHUS** Mart.; Benth. & Hook. f. Gen. Pl. ii. p. 1176.

1. **Æ. elsholtzioïdes** Briq. in Engl. Bot. Jahrb. xix. p. 187 (21 Aug. 1894).

Huilla.—An annual herb, 6 in. to about a foot high; stem erect, cylindrical or tetragonal, glandular-shaggy, somewhat viscid, purplish, sparingly branched; scent weak, not agreeable to every one; leaves bright green, somewhat fleshy, viscid-glandular; flowers deep blue; calyx tubular, short, 4-toothed, the lowest tooth much larger than the rest, bent inwards after flowering and then closing the tube; corolla rather long, tubular, the tube moderately curved, the limb bilabiate, the upper lip trifid or (the middle lobe being deeply emarginate) 4-fid; the lower lip entire, saccate-cymbiform; stamens 4, didynamous; the filaments free, naked; style filiform; stigma bilobed, its branches spreading. In moist meadows and by the clefts of rocks in Morro de Monino, plentiful; fl. and fr. 8 April 1860. No. **5478**. A herb, 6 to 22 in. high. In very elevated rocky places in the same locality, in company with *Streptocarpus* (cf. *S. monophyllus* Welw. herb. n. 1660); fl. and fr. April 1860. No. **5479**.

2. **Æ. Welwitschii** Briq., *l.c.*, p. 188.

Huilla.—A fleshy shrublet, suffused with a reddish colour throughout, sometimes even on the leaves; flowers violet-purple. In the more elevated rocky parts of Morro de Monino; fl. Dec. 1859. No. **5480**. Flowers rosy purple. By rocks in the elevated parts of Morro de Monino; fl. and fr. Jan. 1860. No. **5482**. In the rocky parts of Morro de Lopollo; fl. and fr. May 1860. No. **5481**.

3. **Æ. nodosus** Hiern, sp. n.

A hard and very rigid shrub, 2 to 3 ft. high, glabrous or nearly so, when out of flower much resembling a species of *Sedum*; stem succulent, nodose, ascending, dichotomously branched; branches spreading, ascending, leafy below the terminal inflorescence; leaves opposite, obovate or ovate or nearly orbicular, obtuse at the apex, obtuse or attenuate at the base, fleshy, somewhat thick, lepidote-glaucous, viscid, undulate-crenate on the margin, $\frac{2}{3}$ to 2 in. long by $\frac{1}{3}$ to $1\frac{2}{3}$ in. broad; petioles ranging up to $\frac{3}{4}$ in. long; flowers rosy, very crowded, lasting for a long time, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, very shortly pedicellate or subsessile; panicles pyramidal, minutely viscid-glandular, 3 to 6 in. long; their primary branches patent, 1 to $2\frac{1}{2}$ in. long, bracteate at the base; calyx tubular, $\frac{1}{20}$ in. long; corolla bilabiate; the upper lip 4-lobed; the lobes obtuse, erect-reclined; the lower lip sagittate-tripartite; the middle lobe boat-shaped, obtuse, bent downwards; the lateral lobes triangular-lanceolate, erect or bent backwards; stamens 4, didynamous, two of them sterile; fertile anthers 1-celled by the confluence of the cells, dehiscing transversely; style a little shorter than the filaments, sub-bifid at the apex, the branches cohering; nutlets ovoid, naked.

Pungo Andongo.—By elevated volcanic rocks near Cabondo, plentiful, but only in a few places; fl. April 1857. Nos. **1627**, **5596**.

Nearly related to *Æ. Welwitschii* Briq., but with broader leaves, a more rigid habit, etc.

4. **Æ. elongatus** Briq., *l.c.*, p. 188.
Æolanthus sp., Ficalho, Pl. Uteis, p. 241 (1884).

Golungo Alto.—A strongly aromatic herb, introduced from Casange to the banks of the Luinha ; fr. Dec. 1854. No. **5597**.

Pungo Andongo.—No notes. In fl. and fr. No. **5592**.

Huilla.—An annual, erect herb, branched from the base, rarely simple or nearly so, from 3 in. to scarcely a foot high, the whole plant very sweetly aromatic and beset everywhere with glandular papillæ intermixed on the stem and bracts with viscid hairs ; stem cylindrical or somewhat tetragonal, as well as the spreading-ascending branches glaucescent fleshy and brittle ; leaves oblong-obovate, pale or glaucous-green, somewhat fleshy, pellucid-punctate, brittle ; flower-spikes terminal and axillary, distichous or secund, bracteate ; bracts marked below the apex with a large round reddish gland ; calyx shortly tubular, sub-truncate, densely shaggy-glandular outside and on the margin ; corolla purplish, coloured like that of rosemary, tubular-bilabiate : the tube curved, longer than the calyx ; the upper lip trilobulate, somewhat concave ; the lower lip entire, boat-shaped ; stamens 4, didynamous ; filaments ascending, smooth ; anthers 2-celled ; the cells at length confluent, patelliform ; style filiform, shortly bilobed at the apex ; young nutlets 4, globular, smooth. Cultivated in negro gardens about villages (Libata), and occasionally wild in neglected plots ; apparently introduced from eastern or northern regions, for it is altogether wanting from the western coast region. In Cazengo Welwitsch was told that it had come from the further side of the river Cuango beyond Canange ; it is grown for the sake of its fragrance and is chiefly used for making women's pomatum. In elevated rocky places on the Humpata plateau at an elevation of 5300 ft., about Sambo de Ferrão, rather rare ; fl. April 1860 ; also by the Monino, end of May and beginning of June 1860. Native name "Capiana." No. **5598**.

5. **Æ. rivularis** Hiern, sp. n.

An annual, succulent, scentless herb, glabrous or nearly so, 4 to 9 in. long; stem prostrate, fleshy, rather thick, purplish and divaricately branched below ; leaves ovate or elliptical, rather obtusely narrowed at the apex, more or less wedge-shaped or attenuate at the base, decurrent on the short petiole or the upper ones sessile, fleshy, thick, purplish beneath, obtusely paucidentate, $\frac{1}{4}$ to 1 in. long by $\frac{1}{8}$ to $\frac{1}{2}$ in. broad ; petioles ranging up to nearly $\frac{1}{2}$ in. long ; flowers bluish purple or violet in colour, about $\frac{1}{6}$ to $\frac{1}{4}$ in. long, sessile, arranged in divaricately paniculate spikes ; inflorescence terminal, $1\frac{1}{2}$ to 3 in. long ; bracts ranging up to $\frac{1}{5}$ in. long, usually smaller ; calyx small, about $\frac{1}{30}$ in. long, shortly tubular-campanulate, subtruncate at the apex, somewhat repand-dentate or emarginate, at length bursting in a circumsciss manner leaving a little cup behind ; corolla-tube about $\frac{1}{8}$ in. long, gradually dilated upwards, gibbous above ; the limb deeply bilabiate ; the upper lip subequally 4-lobed ; the lobes spreading like an erect fan, each marked at the base with a transverse purple velvety line ; the lower lip unguiculate, deeply sagittate-trilobate, the

lateral lobes long-acuminate, bent upwards, erect, resembling two elongated auricles; the intermediate lobe deflected in a sigmoid manner, bearded, somewhat obtuse, concave, folded over the two fertile stamens for some time after the flowering; stamens 4; two of them fertile, a little shorter than the two sterile ones; filaments all straight; the sterile anthers capituliform; the fertile ones oblong, 2-celled, longitudinally dehiscent; style but little longer than the stamens, equally bifid at the apex; stigmas punctiform; nutlets smooth, oblong-subpyriform.

Pungo Andongo.—At crags of gneiss rock by the streams of the præsidium on the north-west side; fl. and fr. end of Feb. 1857. Nos. **1630**, **5591**.

6. **Æ. sedoides** Hiern, sp. n.

A perennial, evergreen herb, almost scentless, prostrate, rooting, in habit remarkably like the perennial rock-frequenting species of *Sedum*; stems pale-ashy, glabrate, fleshy-wiry, dichotomously branched; branchlets pubescent, the flowering ones elongated; leaves rosulate-fasciculate, oval, obtuse or rounded at the apex, sessile or subsessile, shaggy-hoary, $\frac{1}{4}$ to $\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{1}{4}$ in. broad, entire or repand-crenate, thick; flowers bright violet in colour, $\frac{1}{4}$ in. long, sessile or subsessile, in subsecund rather dense often pedicellate spikes of $\frac{1}{2}$ to $\frac{3}{4}$ in. long, arranged in terminal and sometimes also axillary panicles which are $1\frac{1}{2}$ to 3 in. long; calyx about $\frac{1}{20}$ in. long, hispid with thick pale hairs, shortly toothed; corolla bilabiate; the tube nearly glabrous, narrowly funnel-shaped; the limb somewhat bearded at the back; the upper lip 4-lobed, its lobes obtuse and erect; the lower lip sagittate-trifid, its lateral segments long-acuminate and bent backwards, its middle segment cymbiform-concave somewhat compressed and hooded at the apex; stamens 4, didynamous, two of them sterile; style rather exceeding the stamens.

Pungo Andongo.—On the elevated rocks of Pedra Cabondo, plentiful but only on the north-west side, in the præsidium, where in the dry season, that is, from May to October, in its apparently dead state it covers them with a very sad colour; but in March after the enlivening effect of the December rains it very pleasantly ornaments these rocks with its crowds of lilac flowers; fl. April 1857. Nos. **1629**, **5594**.

7. **Æ. tuberosus** Hiern, sp. n.

A fleshy, creeping, glaucescent, aromatic herb, with the habit of a *Sedum*, puberulous with glandular papillæ; root tuberous; stems slender, firm, sinuous, elongated, ascending and branched at the terminal inflorescence; leaves opposite or apparently verticillate by reason of the presence of leafy axillary shoots, narrowly elliptical-oblong, narrowed at both ends, sessile or subsessile, entire repand or pauci-denticulate, mostly secund, $\frac{1}{3}$ to $1\frac{1}{6}$ in. long by $\frac{1}{12}$ to $\frac{1}{4}$ in. broad; flowers violet-purplish, about $\frac{1}{2}$ in. long, sessile or subsessile; verticils 2- to 4-flowered, bracteate at the base, distant, arranged in spikes $\frac{1}{2}$ to $2\frac{1}{2}$ in. long; spikes dichotomously paniculate; panicles 3 to 6 in. long; bracts smaller

than the leaves; calyx tubular-campanulate, very shortly 5-toothed, about $\frac{1}{16}$ in. long in flower, in fruit moderately enlarged erect-spreading closed at the mouth circumsciss at the base and deciduous together with the nutlets; the teeth subequally and very shortly deltoid; corolla-tube far exserted, deciduous, quite naked inside, widened towards the throat; the lower lip gibbous at the base; stamens 4, didynamous, the two sterile ones a little longer than the others; style shortly subulate-bifid at the apex.

Pungo Andongo.—In the more elevated rocky wooded parts of Mutollo by Pedras de Guinga, plentiful; fl. and fr. March 1857. Nos. **1628**, **5595**.

8. **Æ. Engleri** Briq., *l.c.*, p. 189.

Huilla.—An erect shrub or a perennial frutescent herb, 2 to 4 ft. high or more, woody at least at the base, throughout sweetly scented like *Ocimum basilicum* but not strongly so, sparingly branched at the apex; main stems nodose, cylindrical, pale greenish, somewhat fleshy; branches mostly opposite; leaves opposite, often with fascicles of other leaves in their axils, somewhat fleshy-coriaceous, rather rigid, erect, pale green and densely but not pellucidly punctate on both faces, denticulate towards the apex, pleasantly aromatic; midrib prominent above, channelled-impressed beneath; flowers arranged in dense compound axillary shortly pedunculate spikes, forming long terminal cylindrical glandular racemes; calyx bibracteolate at the base; the tube shortly tubular-campanulate, truncate at the mouth, deeply 5-crenate, minutely glandular outside; corolla coloured as in *Salvia pratensis* L.; the tube much longer than the calyx, curved in the middle, widened towards the throat; the limb bilabiate; the upper lip erect, 3-lobed, the middle lobe sub-emarginate; the lower lip directed forwards boat-shaped, subentire; stamens 4, didynamous, ascending, inserted on the corolla-tube, subexserted on account of the gaping of the corolla-lips but rather shorter than they, naked; anthers versatile, the cells at length confluent and while dehiscing peltate-circular; style filiform, but little curved, terminating in the small subtruncate more deeply coloured stigma; young nutlets obtusely ellipsoidal, somewhat compressed, angular, smooth, whitish; bracteoles violet-purple, much exceeding the calyx, marked near the apex outside with a large circular gland which is tumid at the margin. In wooded rather elevated damp thickets in Morro de Lopollo, in company with Melastomaceæ and species of *Xyris*, between Catumba and Hai; fl. beginning of April 1860. No. **5615**. A shrub, 3 to 4 ft. high, erect, sparingly branched; bracts, etc., violet-purple. In thickets at the outskirts of the forest between Eme and Ivantâla, rather rare; fl. and fr. end of May 1860. No. **5616**.

Plectranthus Welwitschii Vatke, mentioned by Briquet, *l.c.*, under *Æ. obtusifolius* Briq., included *Æ. Engleri*. *Æ. obtusifolius* is stated to have been collected by Welwitsch, no. 473, at Malandsche (Malange); this is an error; probably Mechow was the collector intended to be mentioned. I have not seen the type of *Æ. obtusifolius*, but from Briquet's description I suspect that Vatke was right in considering it as conspecific with *Æ. Engleri*. Briquet, *l.c.*, p. 190, describes also from Angola *Æ. floribundus*, the type of which I have not seen; but he states that it is very near to *Æ. obtusifolius*, and that the two should, perhaps, be considered as forming varieties of an aggregate species for which he suggests the former name. The three species, namely, these

two and *Æ. Engleri*, he placed in a new section of the genus, which section he calls Cephalælanthus, characterised by the sessile or subsessile cymes being congested in terminal cephaloid racemes.

16. **ALVESIA** Welw. in Trans. Linn. Soc. xxvii. p. 55 (1869); Benth. & Hook. f. Gen. Pl. ii. p. 1176.

1. **A. rosmarinifolia** Welw., *l.c.*, p. 55, t. 19; Wildem. & Durand, Illustr. Fl. Congo, i. fasc. 4, p. 83, t. 42 (June 1899).

Huilla.—An erect undershrub, 3 to 5 ft. high, in habit resembling rosemary but without scent; stems several, more or less strictly erect, obtusely tetragonal, pale purple, decussately ramulose; branchlets erect-patent, mostly abortive; leaves lanceolate, rigidly coriaceous, shining above; panicles terminal; flowers racemose, brilliantly rosy, handsome; calyx shortly campanulate, bilabiate, at length very much enlarged, inflated, vesicular, closed at the mouth, greenish purple, membranous; the upper lip entire, directed forwards; the lower lip somewhat emarginate; corolla-tube cylindrical at the base, above widened in the form of a helmet, vertically compressed; limb bilabiate; the upper lip short, 3-lobed, the middle lobe erect, the lateral lobes truncate; the lower lip entire, directed far forwards, sheathing the stamens; stamens 4, didynamous, ascending, nearly naked, firm; anthers all fertile, bilocular, uniform; the cells almost distinct, obtuse, diverging; style filiform, somewhat acute, very shortly and slenderly bifid. In thin forests and in sandy rather dry secondary thickets near Lopollo and between Nene and Mumpulla, from 4000 to 5200 ft. of elevation, not plentiful; few fl. 26 Jan. 1860, fl. Feb. and April, young fr. May 1860; nearly always in company with various Cæsalpinieæ, Proteaceæ, and Thymelæaceæ. Called by the Portuguese colonists "alecrim do mato" (wood-rosemary). No. **1636**.

It grew in company with *Crotalaria erythrophleba* Welw. herb. no. 1983; see *ante* p. 200. "Alecrim das pedras" (rock rosemary) is *Myrothamnus flabellifolius* Welw. herb. no. 1279, *ante* p. 331.

17. **MESOSPHÆRUM** P. Br. Hist. Jam. p. 257 (1756).

Condea Adans. Fam. Pl. ii. p. 504 (1763). *Hyptis* Jacq. Collect. i. p. 101 (1786); Benth. & Hook. f. Gen. Pl. ii. p. 1178.

1. **M. brevipes** O. Kuntze, Rev. Gen. Pl. ii. p. 525 (1891).

Hyptis brevipes Poit. in Ann. Mus. Par. vii. p. 465 (1806). *Leucas Poggeana* Briq. in Engl. Bot. Jahrb. xix. p. 193 (21 Aug. 1894); cf. Briq. in Bull. Soc. Bot. Belg. xxxvii. p. 61 (13 Aug. 1898).

Golungo Alto.—A herb, 3 to 4 ft. high, at first erect, afterwards subscandent with weak elongated branches among reeds; root fibrous; flowers white; calyx 5- or rarely 6-cleft; the teeth with acute points but not spiny, patent or spreading in fruit; the tube a little inflated about the ripe nutlets; nutlets obvoid-clubshaped, smooth, somewhat angular, blackish purple, very delicately wrinkled; receptacle with numerous elongated hair-like whitish-pellucid erect scales. At the banks of the river Múio in Sobato Quilombo Quiacatubia, sparingly; fl. and fr. middle of July 1856. No. **5576**.

Pungo Andongo.—A herb, 3 to 5 ft. high; stem tetragonal, with elongated subscandent branches; flowers purplish, very small, aggregated within a foliaceous many-leaved involucre. In a damp thicket close to the bank of the river Cuanza at Sansamanda, seen only in one spot; fl. and fr. Jan. 1857. No. **5599**.

2. **M. pectinatum** O. Kuntze, *l.c.*

Nepeta pectinata L. Syst. Nat. ii. p. 1097 (1759). *Hyptis pectinata* Poit., *l.c.*, p. 474, t. 30.

Ambriz.—In the Mosul marshes ; fl. and fr. Nov. 1853. No. **5560**.

Barra do Dande.—A tall, erect, agreeably fragrant, branched herb, 3 to 6 ft. high, with white or occasionally violet or purplish flowers. In swamps throughout the district ; at the lakes on the right bank of the river Dande near Bombo, plentiful ; fl. and fr. Sept. 1858. Used instead of incense by the inhabitants of the Lifune and Dande kingdom, and called by the negroes "Quinbumbo," "Quinbungu," "Quibumbo," or "Quinbumba." No. **5531** and Coll. Carp. 857.

Barra do Bengo.—In palm groves between Quifandongo and Barra de Bengo, rather rare ; fl. and fr. Dec. 1853. No. **5532**.

Golungo Alto.—Between Trombeta and Cabondo ; fl. and fr. Sept. 1854. No. **5830**. A herb, somewhat woody at the base, perennial, very variable in habit so that it could be easily split into 3 or 4 species by critical botanists ; scent scarcely pleasant, almost mousy ; stem obtusely quadrangular, furrowed on the sides, usually tall, 2 to 5 ft. high, mostly from pale to blackish purple ; flowers arranged sometimes in long erect acuminate nearly naked spikes, sometimes in verticils occupying the axils of the leaves and concealed by them ; corolla yellow, the tube whitish, the limb bilabiate, the upper lip bifid, the lower lip trifid, all the lobes rounded-obtuse at the apex and spreading, the middle lobe violet in colour. In damp places by streams and in wet reed-beds, etc., plentiful ; near Sange, Camilungo, and Bango ; fl. and fr. July 1855. No. **5561**.

Mossamedes.—In gravelly places at the river Maiombo between Pomangale and Cazimba, sporadic ; fr. after the fall of the corolla, June 1860. No. **5487**.

18. **LAVANDULA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1179.

1. **L. stricta** Delile, Fl. d'Egypte, p. 238, t. 32. fig. 1 (1812), & Illustr. p. 65.

L. coronopifolia Poir. Encycl. Méth. Suppl. iii. p. 308 (1813) ; J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 218 (1852).

Cape de Verde Islands.—Island of St. Vincent ; fl. and fr. Aug. 1853. No. **5523**.

19. **MENTHA** Tournef., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1182.

1. **M. piperita** L. Sp. Pl., edit. 1, p. 576 (1753).

Loanda.—No notes. In fl. and fr. No. **5557**.

Our specimens have a smaller foliage than is usual with this cultivated plant, which by some botanists is considered to be a hybrid between *M. viridis* L. and *M. aquatica* L. ; at all events they were probably not indigenous at Loanda.

Golungo Alto.—Cultivated in kitchen gardens ; without fl. or fr. July 1855. Possibly belonging here. No. **5558**.

The following No. possibly belongs to the hirsute form of *Mentha aquatica* L., *l.c.*, p. 576 :—

Golungo Alto.—A low prostrate herb. By the banks of the river Cuango, in damp cultivated ground at Arimo do Mariano ; without fl. or fr. end of Sept. 1855. No. **5587**.

20. **ORIGANUM** Tourn., L.; Benth. & Hook. f. Gen. Pl. ii. p. 1185.

1. **O. Majorana** L. Sp. Pl., edit. 1, p. 590 (1753).

Loanda.—A suffruticose herb, very pleasantly aromatic, 1½ to 2 ft. high, hoary-pubescent on all parts including the branches except the white corolla; calyx turbinate, in front cleft to the base. Cultivated in gardens but rather rarely: at the quintal of Dr. Mendes Alfonso; fl. 17 Oct. 1858. No. **5559**.

21. **CLINOPODIUM** Tournef., L. Sp. Pl., edit. 1, p. 587 (1753).

Calamintha Lam. Fl. Fr. ii. p. 393 (1778); Benth. & Hook. f. Gen. Pl. ii. p. 1190; non Adans. (1763).

1. **C. Calamintha** O. Kuntze, Rev. Gen. Pl. ii. p. 515 (1891).

Melissa Calamintha L. Sp. Pl., edit. 1, p. 593 (1753). *Calamintha officinalis* Moench, Meth. Pl. p. 409 (1794); Benth. in DC. Prodr. xii. p. 228 (1848).

Var. **villosissimum** (Benth., *l.c.*; Lowe, Prim. Mad., app. C, p. xi [1851]).

Island of Madeira.—At Camara dos Lobos; fl. and fr. 12 Aug. 1853. No. **5539**.

22. **SALVIA** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 1194.

1. **S. pseudococcinea** Jacq. Collect. ii. p. 302 (1788).

Island of Madeira.—Woody and branched near the base; flowers scarlet. Excursion to Camara dos Lobos; fl. and fr. 12 Aug. 1853. No. **5540**.

23. **ACHYROSPERMUM** Blume; Benth. & Hook. f. Gen. Pl. ii. p. 1208.

1. **A. æthiopicum** Welw. in Trans. Linn. Soc. xxvii. p. 56 (1869).

Pungo Andongo.—A perennial, erect herb, 5 to 7 ft. high; stem sparingly branched, obtusely tetragonal, giving off from the middle to the apex in the axils of the leaves solitary spikes of flowers; spikes tetragonal-pyramidal, 1½ to 2½ in. long; calyx white, elongate-campanulate, tubular, dilated towards the limb, 5-toothed, sub-bilabiate, the three teeth of the upper lip a little larger than the two of the lower lip, all acute; corolla white, tubular; the tube straight, closed at its middle with 5 scales directed downwards; the limb 5-cleft, bilabiate; the upper lip shortly or slightly bilobed; the lower lip trifid, the middle lobe very broad, the segments obtuse; stamens 4, didynamous, sub-exserted or sometimes quite exserted, inserted at the middle of the corolla-tube; filaments sub-compressed, short; anthers bilocular or by confluence unilocular, dehiscing longitudinally; style filiform; stigma bilobed; the lobes cylindrical, short, equal; nutlets crowned at the apex with very numerous closely interwoven membranous whitish scales resembling a pappus. In the shady forest at a cataract in the rocky Calundo valley, near the præsidium, sporadic and rather rare; fl. 6 May, half-ripe fr. 18 May 1857. No. **1633**.

24. **STACHYS** Tournef., L.; Benth. & Hook. f. Gen. Pl. ii. p. 1208.

1. **S. andongensis** Hiern, sp. n.

A perennial herb; stems numerous, 4 ft. high, branched, densely

leafy, bluntly tetragonal, furrowed, stellate-hairy towards the apex; leaves ovate, acuminate and often very acute at the apex, more or less cordate at the base, thinly herbaceous or softly membranous, dark green and sparingly stellate-hairy above, hoary and densely stellate-hairy beneath, denticulate, 2 to $4\frac{1}{2}$ in. long by $\frac{3}{4}$ to $2\frac{1}{4}$ in. broad; petiole more or less hoary, stellate-hairy; flowers violet-rosy, about $\frac{5}{8}$ in. long; pedicels $\frac{1}{20}$ to $\frac{1}{10}$ in. long, stellate-hairy; verticils many-flowered, distant or the upper ones approximated, the lower ones leafy at the base, together forming a terminal slightly leafy inflorescence; calyx nearly $\frac{1}{3}$ in. long, stellate-hairy outside, glabrous inside, campanulate-oblong, sub-regularly 5-toothed; the tube inconspicuously nerved, $\frac{1}{6}$ in. long; the teeth lanceolate, subulate, erect; corolla-tube cylindrical, $\frac{1}{4}$ in. long, gibbous-dilated about the middle, densely pilose inside at the insertion of the stamens: the limb bilabiate, the lower lip 3-lobed; the middle lobe rotundate-obcordate, crenulate on the margin; the lateral lobes much shorter, obtuse; the upper lip rotundate-conchiform, concave, erect, much shorter than the lower lip; stamens 4; anthers shortly exserted; style shortly bilobed at the apex, the branches cylindrical.

Pungo Andongo.—In damp thickets about the gigantic rocks of Catete, plentiful; fl. beginning of Dec. 1856. No. **5546.**

2. **S. huillensis** Hiern, sp. n.

A perennial herb, 1 to 2 ft. high; rootstock woody; stems numerous, erect or ascending, somewhat woody at the base, herbaceous and sparingly branched above, roundedly tetragonal, furrowed, hoary and tomentose with stellate hairs at the top, moderately leafy; leaves ovate-oblong, narrowed and scarcely acuminate at the apex, somewhat narrowed or nearly rounded at the subsessile base, herbaceous, dark green and sparingly stellate-hairy above, paler and more or less stellate-felted beneath, denticulate, 1 to 3 in. long by $\frac{1}{3}$ to 1 in. broad; flowers white, about $\frac{3}{8}$ in. long; pedicels very short, $\frac{1}{40}$ to $\frac{1}{20}$ in. long, stellate-hairy; verticils several-flowered, the lower ones distant and axillary, the upper ones closer together and forming a terminal bracteate spike, the whole inflorescence 4 to 8 in. long; calyx $\frac{1}{4}$ in. long, campanulate-oblong, stellate-hairy outside, glabrous inside; the tube $\frac{1}{8}$ in. long, 10-nerved; the lobes lanceolate, subulate, unequal in breadth at the base; corolla-tube cylindrical, $\frac{1}{4}$ in. long, not gibbous about the middle, not densely pilose inside at the insertion of the stamens; the limb bilabiate, the lower lip 3-lobed, the middle lobe rotundate, repand; the lateral lobes much shorter than the middle lobe, obtuse; the upper lip rotundate, concave, much shorter than the lower lip; stamens 4, didynamous; anthers shortly exserted; style shortly bifid at the apex, falling short of the longer filaments.

Huilla.—In dry bushy pastures, from Lopollo to Catumba; fl. Feb. to April 1860. No. **5509.** In muddy swampy wooded places, from Ohai to Catumba; fl. April 1860. No. **5510.**

25. **LEUCAS** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 1213.

Lasiocorys Benth. Lab. Gen. & Sp. p. 600 (1834); Benth. & Hook. f., *l.c.*

1. **L. martinicensis** Ait. Hort. Kew. edit. 2, iii. p. 409 (1811).

Clinopodium martinicense Swartz, Enum. Syst. Pl. p. 25 (1760). *Phlomis caribæa* Jacq. Collect. i. p. 154 (1786); Swartz, Fl. Ind. Occ. ii. p. 1009 (1800). *P. Martinicensis* Swartz, Prodr. p. 88 (1788).

Pungo Andongo.—In fl. and fr. Dec. 1856. Nos. **5542**, **5586***b*.

Huilla.—In fl. and fr. Jan. 1860. No. **5503**. A herb, 1 to 3 ft. high, annual, smelling like a *Lamium*, with the habit of a *Leonotis*; flowers small, inconspicuous; corolla white, the tube long, the limb bilabiate; the middle lobe of the lower lip constantly larger than the lateral lobes, usually more or less bifid or at least emarginate at the apex so that the lip appears 4-cleft; the upper lip entire, erect, very hairy. In neglected fields near Lopollo, plentiful; in the national garden, fl. 31 March 1860. No. **5502**.

2. **L. decurvata** Baker ms. in herb. Kew.

A rather slender, erect, puberulous, annual herb, 16 to 24 in. high or more, sparingly branched; stem obtusely quadrangular, furrowed; leaves elliptical, narrowed to the acute or sub-obtuse apex, wedge-shaped at the base, membranous, minutely glandular, more or less puberulous, green above, slightly or scarcely paler beneath, more or less often deeply dentate except the lower part, 1 to $3\frac{1}{2}$ in. long by $\frac{1}{3}$ to $1\frac{1}{2}$ in. broad; petioles ranging up to $\frac{1}{2}$ in. long; flowers numerous, sessile or subsessile, crowded in dense sessile axillary and subterminal verticils, $\frac{1}{4}$ to $\frac{3}{8}$ in. long; verticils subglobose, $\frac{1}{3}$ to 1 in. in diameter, bracteate at the base; bracts numerous, filiform-subulate or sub-linear, mostly $\frac{1}{4}$ to $\frac{3}{8}$ in. long, ciliate; calyx $\frac{1}{5}$ to $\frac{1}{4}$ in. long in flower, $\frac{1}{3}$ to $\frac{3}{8}$ in. long in fruit; the tube ellipsoidal-oblong, rather compressed, somewhat turbinate at the base, curving downwards at the apex, more or less hispidulous or puberulous, 10-nerved, about $\frac{1}{6}$ in. long in flower and $\frac{1}{4}$ in. long in fruit; the limb bilabiate; the lower lip spreading or deflected, transversely oblong, 5-fid, $\frac{1}{10}$ to $\frac{1}{8}$ in. long, the lobes subulate, the middle 3 arising from a deltoid base; the upper lip short, subtruncate with 5 erect subulate teeth; corolla-tube shortly exceeding the calyx, erect; the limb bilabiate; the lower lip spreading, about $\frac{1}{15}$ in. long, trifid; the middle lobe the largest, emarginate at the apex; the upper lip erect, hairy outside, fringed, $\frac{1}{12}$ to $\frac{1}{10}$ in. long, broadly obovate, concave, entire.

Golungo Alto.—In fl. and fr. Nos. **5526**, **5541**.

Nearly related to *L. martinicensis* Ait.

3. **L. Welwitschii** Gürke in Engl. Bot. Jahrb. xxii. p. 141 (19 Nov. 1895).

Pungo Andongo.—A herb, 1 to $1\frac{1}{2}$ ft. high; rootstock woody; stems numerous, erect or ascending; flowers brilliantly white. In the forest on a ferruginous clay soil, near Quibango; fl. and fr. Jan. 1857. No. **5563**.

4. **L. Bakeri** Hiern, sp. n.

An annual, erect, pubescent, minutely glandular, hoary-greenish herb, 1 to $2\frac{1}{2}$ ft. high, with the smell of a *Lamium*, more or less branched from the base; stem obtusely tetragonal, rather slender, its pubescence directed downwards; branches spreading, ascending, leafy towards the apex; leaves linear or nearly so, obtusely narrowed or scarcely acute at the apex, somewhat narrowed at the sessile base, paucidentate, firmly herbaceous, punctulate, $1\frac{1}{4}$ to $2\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{3}{8}$ in. broad; flowers $\frac{1}{4}$ in. long, subsessile, several, crowded together in axillary and quasi-terminal verticils; verticils bracteate at the base; bracts several, filiform-subulate, strongly ciliate, $\frac{1}{6}$ to $\frac{1}{5}$ in. long; calyx $\frac{1}{4}$ in. long in flower, $\frac{1}{3}$ in. long in fruit, 10-ribbed, tubular-bilabiate; the tube $\frac{1}{8}$ in. long, somewhat turbinate, more or less pubescent inside and out; the limb 10-lobed; the teeth acute, subulate, joined together below with an arachnoid membrane, separate at the apex, three of them taller than the rest; corolla $\frac{1}{6}$ in. long, rather shorter than the calyx, white, the tube $\frac{1}{8}$ in. long; the upper lip emarginate at the apex or shortly 2-lobed, densely white-shaggy; the lower lip 3-lobed; stamens shorter than the corolla; nutlets 4, truncate.

Pungo Andongo.—In wooded meadows at the right bank of the river Cuanza between Muta Lucala and Quibinda, plentiful; fl. and fr. March 1857. No. **3232**.

Huilla.—In potato fields near Lopollo; fl. Dec. 1859. No. **5512**. On the Empalanca plateau; fl. beginning of April 1860. No. **5513**.

5. **L. ebracteata** Peyritsch in Sitzb. Akad. Wien, Math.-Nat. xxxviii. p. 577 (1860).

I have not seen the type of this species; our specimens which are described below appear to belong to it:—

An annual, erect or decumbent, usually branched herb, with the habit of a *Leonotis*, from a few inches to a few feet high; the stem trichotomously branched and the spreading branches obtusely tetragonal, 4-furrowed, minutely glandular, pubescent with short downward hairs, pallid; leaves elliptical or oval, obtuse at the apex, somewhat narrowed towards the base, thinly herbaceous, softly puberulous, minutely glandular, dark green above, paler and more pubescent along the veins beneath, strongly crenate-dentate, $\frac{3}{4}$ to $2\frac{1}{2}$ in. long by $\frac{3}{8}$ to $1\frac{1}{2}$ in. broad; petioles ranging up to $\frac{1}{3}$ in. long, pubescent; flowers white, $\frac{2}{3}$ in., subsessile or very shortly pedicellate, numerous, crowded in axillary and subterminal verticils; verticils not conspicuously bracteate at the base, sessile; bracts minute; calyx tubular-turbinate, bilabiate, $\frac{1}{2}$ in. long or in fruit rather longer, pubescent outside, naked inside; the tube about $\frac{5}{16}$ in. long, 10-ribbed, not contracted at the mouth; the lower lip subquadrate, tridentate at the apex, about $\frac{1}{6}$ in. broad, suberect, the teeth shortly subulate; the upper lip very short, subtruncate, 5-dentate; the teeth unequal, rather short and subulate; corolla nearly $\frac{2}{3}$ in. long, bilabiate; the tube nearly $\frac{1}{3}$ in. long, about $\frac{1}{20}$ in. in diameter at the base, gradually dilated in the upper half; upper lip erect, about $\frac{1}{3}$ in. long, obovate-

oblong, densely hairy outside, strongly fringed, glabrous inside, emarginate at the apex; lower lip obovate, $\frac{1}{4}$ in. long, trifid, pubescent at the back except the middle lobe; the middle lobe the largest, bifid; stamens scarcely equalling the upper lip, rather longer than the style which is unequally bifid at the apex; nutlets 4, papillose at the apex.

Benguella.—Among rubbish and in neglected fields, everywhere around the city; fl. and fr. June 1859. No. **5501**.

Mossamedes.—In neglected plots after cultivation, and around negro-huts, between Quipola and Mata dos Carpenteiros, rather rare; fl. and fr. June 1859. Also in sandy herbaceous places at the river Bero and in neglected plots; fl. July 1859. No. **5516**.

Bumbo.—In fields after being planted with *Arachis hypogæa* L.; fl. Oct. 1859. Only one specimen. No. **5517**.

6. **L. altissima** Engl. Bot. Jahrb. x. p. 268 (9 Oct. 1888).

Mossamedes.—An erect or ascending, very elegant herb, apparently annual or biennial, 2 to $2\frac{1}{2}$ ft. high; leaves herbaceous-green; flowers white; verticils clothed with whitish wool. In sandy thickets at the banks of the river Bero; fl. July 1859. No. **5484**.

7. **L. Eenii** Hiern, sp. n.

An annual, straight, erect herb, 2 to 3 ft. high, sparingly branched; stem pubescent with short downward hairs, pallid, obtusely tetragonal, sulcate; internodes mostly longer than the leaves; leaves lanceolate or narrowly elliptical, narrowed at the apex to an obtuse point, somewhat wedge-shaped at the sessile base, firmly herbaceous, somewhat pubescent, green above, a little paler beneath, crenate-serrulate except towards the base, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{1}{2}$ in. broad; flowers white, $\frac{1}{4}$ in. long or rather longer, sessile or subsessile, numerous, crowded in axillary and subterminal verticils; verticils subglobose, $\frac{1}{2}$ to 1 in. in diameter, sessile, bracteate at the base; bracts numerous, filiform, subulate, strongly ciliate, $\frac{1}{8}$ to $\frac{1}{4}$ in. long, the tip cartilaginous, acute; calyx $\frac{1}{5}$ in. long; the tube campanulate-oblong, nearly straight, a little narrowed near the base, scarcely contracted at the mouth, $\frac{1}{7}$ in. long, 10-nerved, pubescent outside, less conspicuously pubescent inside along the nerves; the limb slightly bilabiate in flower; teeth 5, subulate from a broad base, pubescent except the acute cartilaginous apex, the two anterior ones a little longer in flower and less erect than the rest; corolla about $\frac{1}{4}$ in. long, thinly pubescent outside, bilabiate; the anterior lip spreading, trifid, $\frac{1}{7}$ in. long; the middle lobe obovate, entire, longer than the lateral lobes; the posterior lip oval-oblong, emarginate at the apex, somewhat spreading, $\frac{1}{8}$ in. long; tube narrowly funnel-shaped, $\frac{1}{5}$ in. long, glabrous below; the throat not bearded; stamens 4, didynamous, included, inserted about the middle of the corolla-tube; style included, hairy above, obsoletely bilobed; nutlets obpyramidal, truncate, shining.

Mossamedes.—In gravelly thickets at the banks of the river Bero; fl. and fr. July 1859. No. **5486**.

This belongs to the section Lasiocorys (Benth.); it was also collected

by T. G. Een in Damara-land in 1879. Such is the correct spelling of the collector's name, although in the Botanical Magazine, t. 6783, Mr. Baker stated that the bulb of *Crinum leucophyllum*, the plant which he there described, had been brought from Damara-land "by a Danish sea captain of the name of Thurè Gustave Ein"; in the Flora of Tropical Africa, however, vii. p. 397 (1898), for the same species the name is given as Thure Gustaf Een. The genus *Eenia* Hiern & S. Moore in Journ. Bot. 1899 p. 373, in Compositæ, was named in honour of the same collector.

26. **LEONOTIS** R. Br.; Benth. & Hook. f. Gen. Pl. ii. p. 1214.

1. **L. nepetifolia** Ait. Hort. Kew. edit. 2, iii. p. 409 (1811).

Phlomis nepetæfolia L. Sp. Pl., edit. 1, p. 586 (1753). *P. nepetifolia* L. Syst. Nat., edit. 12, ii. p. 398 (1767). *L. nepetæfolia* Benth. in DC. Prodr. xii. p. 535 (1848).

Loanda.—An annual herb, 2½ ft. high; leaves ranging up to 4 in. long and broad, petioles to 3 in. long. In fl. and fr. Nos. **5562**, **5577**.

Huilla.—At Humpata; in fl. and fr. April 1860. No. **5500**.

Prince's Island.—In fl. and fr. Sept. 1853. No. **5578**.

This is probably the *Leonotis* referred to by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 7 (Aug. 1854), p. 84. n. 88, as occurring in wooded places near Freetown, Sierra Leone, Sept. 1853.

Negro names are "Maluvo m'angilla" or "Maluvo iamgilla," and "Maluvo iamçonço"; a decoction of the plant is used in diseases of the abdomen.

27. **TINNEA** Kotschy & Peyritsch; Welw. in Trans. Linn. Soc. xxvii. p. 57 (1869); Benth. & Hook. f. Gen. Pl. ii. p. 1220.

1. **T. antiscorbutica** Welw., *l.c.*, p. 58; Ficalho, Pl. Uteis, p. 241 (1884).

Golungo Alto.—An undershrub or herbaceous plant, woody at the base, 4 to 6 ft. high and more; rootstock thick, polycephalous; stems numerous, tetragonal; leaves opposite or ternate or more rarely alternate, the floral leaves and the bracts softly silky; inflorescence thyrsoid, violet-rosy throughout; bracts rosy; calyx tubular-campanulate, horizontally compressed, bilabiate, closed after the flowering; the lobes entire, rounded-obtuse, somewhat concave, persistent, silky-rosy outside, intensely rosy inside; corolla-tube but little exserted, nearly straight, naked and whitish inside, dilated at the throat; limb bilabiate, large; the upper lip short, bilobed; the lobes rotundate-obtuse, overlapping; the lower lip large, 3-lobed; the lateral lobes short, obtuse; the intermediate lobe very large, obcordate-rotund, velvety with intensely purple felt; the throat together with the limb horizontally compressed; stamens 4, somewhat ascending, all fertile; filaments flattened, subcanaliculate, somewhat pilose on the sides, longer than the lower lip of the corolla, dilated into an obtuse fleshy incurved intensely yellow spathulate top under the upper lip, but little exserted; anthers approximated in pairs, all bilocular, the cells ovoid-globose; style bifid at the apex; the upper branch short, subulate, not stigmatose; the lower branch longer, stigmatose; the hypogynous disk thick, elevated, not dentate, obsoletely angular; nutlets obovoid when young, obtuse, but little compressed, glabrous on the inner side, subgibbous, silky-tomentose outside; the mature nutlets winged. In thin rocky woods and on the more elevated slopes of the mountains in the central

and eastern Queta, not uncommon, flowering from August to December and fruiting from November to February; at Sange, Nov. 1854 and Feb. 1855; at Carengue, Sept. and Dec. 1855. The powder of the dried leaves is remarkably antiscorbutic. The native name is "Catete Bulla." No. **1632**. Fruiting calyx simulating a pericarp, $\frac{2}{3}$ in. long; carpels 4, resembling seeds, surrounded with a long fringe, altogether about $\frac{1}{3}$ in. long. Among the Queta mountains; fr. Aug. 1856. Coll. Carp. 807.

Pungo Andongo.—An undershrub, 2 to 3 ft. high; leaves obtusely emarginate at the apex. In the less dense woods near the præsidium in the direction of Catete, sparingly; in young fl. March 1857. No. **1631**. At Mopopo; fr. 30 April 1857. Coll. Carp. 852.

In Golungo Alto this plant is very abundant; there and also in Pungo Andongo it is called "Catete Bulla"; the tender shoots and the leaves, dried and reduced to a powder, and administered either in bulk or in the form of a saturated infusion, were at times recommended to Welwitsch by the negro doctors as furnishing one of the most efficacious remedies for scorbutic diseases especially for those of the mouth; he, however, had no opportunity of convincing himself of any salutary effects in such cases. See Welw. Synopse Explic. p. 28. n. 62 (1862).

2. **T. eriocalyx** Welw., *l.c.*, p. 59.

Huilla.—A suffrutescent herb, 2 to 4 ft. high, silky-woolly in some forms; rootstock thick, woody, polycephalous; stems clustered, erect, tomentose, simple or branched at the middle; leaves opposite or ternate or on the same specimen alternate, all opposite in some forms, quite entire, firmly membranous, ovate or oval, shortly petiolate; flowers whitish rosy or pale purple, solitary in the axils of the upper leaves, subsecund, somewhat drooping, shortly pedunculate, bibracteolate below the middle; calyx globose, vesicular-turgid, closed in the bud, opening by a transverse chink, with both the upper and the lower lips quite entire and subrotund-truncate, closed after the flowering, enlarged in fruit and cleft to the base, persistent, completely concealing the carpels; corolla intensely violet-purple; the tube included in the calyx, but little curved, hirsute inside at the insertion of the stamens; the throat transversely dilated; the limb bilabiate; the upper lip ascending, emarginate-bifid; the lower lip trifid; the lateral lobes shorter than the intermediate one, equalling the upper lip; the middle lobe dilated, emarginate, directed forwards; stamens 4, exserted, ascending-deflected, the lower pair the longer, all fertile; filaments of the upper pair filiform, those of the lower pair clavate at the apex and twice as thick as the upper ones, all articulate at the apex to the yellow pulvinate-tumid connective; anthers bilocular, the cells separate at the base and dehiscing longitudinally, the pollen whitish; ovary 4-lobed, placed on the short thick disk, the lobes papilliform erect and equal; style central, filiform, somewhat thickened at the middle, a little shorter than the acute terminal stigma; nutlets 4 or 3, rarely fewer, elongated-clavate, erect, ventricose and naked on the inner side, girt on the outer side and quasi-scutellate with a broad wing consisting of fibres some radiating and others transverse and arachnoid-intertwined. In rather dry hilly bushy places and at the outskirts of forests between Lopollo and Mumpulla and between the former place and Catumba, plentiful; fl. from Dec. 1859 to end (26th) of March 1860. No. **1635**. In fr. 9 May 1860, at Lopollo. "Catete Bulla de Lopollo." Coll. Carp. 32.

28. **AJUGA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1222.

1. **A. Iva** Schreb. Pl. Vert. Unilab. p. 25 (1773) ; J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 224 (1852).

Cape de Verde Islands.—Island of St. Vincent ; without fl. or fr. Aug. 1853. No. **5524**. Island of St. Jago ; in rocky places near Villa da Praia ; fl. Jan. 1861. No. **5525**.

XCVIII. PLANTAGINEÆ.

1. **PLANTAGO** Tournef., L. ; Benth. & Hook. f. Gen. Pl. ii. p. 1224.

1. **P. major** L. Sp. Pl., edit. 1, p. 112 (1753) ; J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 181 (1852).

Barra do Dande.—In marshy herbaceous places on the left bank of the river Dande, not common ; fl. and fr. Nov. 1853. The variety *sinuata* Decaisne in DC. Prodr. xiii. 1, p. 694 (1852). No. **513**.

Loanda.—By dried-up ponds or lakes behind Fazenda de Quicuxe ; fl. and fr. July 1854. No. **513***b*. In gardens ; fr. Oct. 1860. A very large form. Coll. Carp. 859.

Golungo Alto.—Annual or persisting for several years, sometimes dwarf, sometimes with large leaves a foot long ; spikes almost a foot long, often at least 1½ ft. ; flowering nearly all the year. At the herbaceous banks of the river Quiapose, and in fields about Sange, plentiful and almost ubiquitous ; fl. and fr. June and July 1856. No. **514**. Biennial ; in damp fields near Sange, not uncommon ; fl. and fr. July 1856. The variety *asiatica* Decaisne, *l.c.* No. **513***c*. A form with comparatively distant flowers, collected with the last. No. **513***d*.

Cape de Verde Islands.—In moist places on the top of Monte Verde in the Island of St. Vincent ; fl. 20–21 Aug. 1853. A slender form. No. **523**.

2. **P. arborescens** Poiret in Lam. Encycl. Méth. v. p. 389 (1804) ; Welw. in Ann. Cons. Ultramar. Lisb. No. 7 (August 1854), p. 81, n. 36.

Var. **maderensis** Harms in Engl. Nat. Pflanzenfam. iv. 3*b*, p. 373 (1895).

P. maderensis Decaisne, *l.c.*, p. 733.

Island of Madeira.—A shrublet, a foot high, not at all arborescent ; branches woody, ascending. In dry stony places between Funchal and Camara dos Lobos ; fr. 13 Aug. 1853. No. **515**.

XCIX. NYCTAGINEÆ.

1. **MIRABILIS** Riv., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 3 (Feb. 1880).

1. **M. Jalapa** L. Sp. Pl., edit. 1, p. 177 (1753).

M. dichotoma L. Syst. Nat. edit. 10, ii. p. 931 (1759) ; Welw. Apontam. p. 547 sub n. 76 (1859).

Icolo e Bengo.—Cultivated at the convent of Santo Antonio ; fr. Dec. 1853. No. **5377***b*.

Golungo Alto.—In the primitive forest at the river Luinha, quite wild and plentiful, doubtfully indigenous ; fl. Dec. 1854. No. **5377**.

Cazengo.—A tall herb, 3 to 4 ft. high ; flowers white, fragrant, with

a long tube. In moist primitive forests at the banks of the river Luinha, wild and plentiful; fl. June 1855. No. **5376**.

In Pungo Andongo it is abundant along streams: see note under *Polygonum lanigerum* R. Br. Welwitsch considered that this plant must have been originally introduced into Angola (and probably into all the other districts of Africa where it occurs) by the missionaries, because its fruit, as also that of *Abrus*, *Canna*, *Coix*, etc., is used for the so-called chaplets or crowns of roses.

2. **BOERHAVIA** L. Sp. Pl., edit. 1, p. 3 (1753).

Boerhaavia Vaill. Sermo, p. 50 (1718); Murr. Syst. Veg. p. 50 (1774); Benth. & Hook. f. Gen. Pl. iii. p. 5.

1. **B. repens** L., *l.c.*; J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 179 (1852).

B. diffusa L., *l.c.* *B. suberosa* Chr. Sm. in Tuckey, Congo, p. 249 (1818). *B. depressa* Chr. Sm., *l.c.* *B. hereroensis* Heimerl in Engl. Bot. Jahrb. x. p. 9 (6 July 1888).

Icolo e Bengo.—In dried-up pools at the river Bengo; fl. and fr. Jan. 1854. No. **5387**. In muddy-sandy places, quite dry in winter, flooded in summer, around Lagoa de Quilonde; fl. and fr. beginning of Sept. 1857. No. **5388**.

Loanda.—In hot sandy places near Penedo; fl. and fr. March 1858. No. **5389**. An annual herb, branched from the root; branches prostrate, virgate-ramulose; flowers rosy. In sandy places flooded in summer, in short grass between Penedo and Conceição; fl. and fr. March 1854. No. **5390**. Annual, prostrate, with violet-coloured flowers. In muddy places near Loanda; fr. May 1854. Coll. Carp. 860. In sunny sandy places near Penedo; fr. May 1858. No. **5389**.

Pungo Andongo.—In sandy rocky parts of the præsidium; fl. and fr. March 1857. An annual prostrate herb, with discolorous leaves and violet-coloured flowers. In dry, rocky-sandy places in the court-yard of the residence of the governor of Pungo Andongo, plentiful; fl. and fr. April 1857. No. **5385**.

Cape de Verde Islands.—In the island of St. Vincent; without fl. or fr. Aug. 1853. No. **5381**.

2. **B. adscendens** Willd. Sp. Pl. i. p. 19 (1797); Ficalho, Pl. Uteis, p. 242 (1884) (*Boerhaavia*).

Ambriz.—In fl. Nov. 1853. No. **5386**. At Quisembo; fl. and fr. Nov. 1853. Called "Herba tostão." No. **5382**.

Barra do Dande.—A weak, slender herb, with greenish glaucescent stems and whitish lilac flowers. In bushy moist hilly places near the mouth of the river Dande; fl. and fr. Nov. 1853. No. **5392**.

Loanda.—Cazanga island; fl. March 1858. No. **5383**. A perennial herb; root tubercular; stems decumbent-ascending; leaves somewhat fleshy. In sandy maritime and hilly bushy places throughout the district and also in the coast region at Penedo, plentiful; fl. and fr. May and June 1858. The Portuguese colonists call it "Herba tostão." No. **5384**. A decumbent herb or almost an undershrub; rhizome thick, woody-spongy, polycephalous; stems prostrate, 1½ to 3 ft. long; branches and branchlets ascending; leaves somewhat fleshy, pallid, glaucescent, with the aspect almost of *Atriplex*; flowers rather small, pale violet in colour. In barren sparingly grassy hilly places to the south-west of Loanda, at Praia da Zamba grande; fl. and fr. end of Dec. 1858. No. **5393**.

Golungo Alto.—In thickets near Quiquelequele ; fl. and fr. July 1856. No. **5380.**

Prince's Island.—" Herba tostão." In fl. Sept. 1853. No. **5391.** In Ambriz and Loanda the natives call this plant " Embate " or " Batebate " ; a decoction of the tuberous root is used as a remedy in cases of jaundice. It is also called " Ditumbâte," plural " Matumbâte."

3. **B. plumbaginea** Cavan. Icon. ii. p. 7. n. 121. t. 112 (1793). *Valeriana scandens* Forsk. Fl. Ægypt.-Arab. p. 12 (1775) ; non Loefl. (1758). *B. dichotoma* Vahl, Enum. Pl. i. p. 290 (1804).

Loanda.—A perennial herb ; rootstock woody, polycephalous ; flowers lilac. In dry hilly places near the convent of Santo José at Loanda ; fl.-bud and fr. Dec. 1853 and Feb. 1854. No. **5379.** Flowers lilac or violet-purple. In hilly bushy places above Penedo and near Boa Vista ; fl. and fr. March 1854. No. **5395.** A herb, 3 to 8 ft. long, almost scandent, or decumbent on other shrubby plants ; flowers comparatively large. Very plentiful in all the littoral districts of Angola, flowering nearly the whole year ; at Alto das Cruzes, Dec. 1853 ; at Praia da Zamba grande, July 1858 ; fl. and fr. No. **5394.**

Golungo Alto.—At Cacarambola ; in fl.-bud and fr. Aug. 1856. A decoction of the root is used as a remedy in cases of jaundice. No. **5396.**

3. **BUGINVILLÆA** Commers. ex Juss. Gen. Pl. p. 91 (1789) ; Benth. & Hook. f. Gen. Pl. iii. p. 7. (*Bougainvillæa*).

1. **B. spectabilis** Willd. Sp. Pl. ii. p. 348 (1799).

Cape de Verde Islands.—Cultivated in the interior parts of the island of San Thiago ; fl. Jan. 1861. No. **5378.**

C. ILLECEBRACEÆ.

1. **POLLICHIA** Ait. ; Benth. & Hook. f. Gen. Pl. iii. p. 14.

1. **P. campestris** Ait. Hort. Kew. edit. 1, p. 5 (1789).

Mossamedes.—A suffrutescent herb or a shrublet, 2 to 3 ft. high ; rhizome polycephalous ; stems divaricately branched, the young shoots clothed with a snow-white felt; flowers fasciculate, the bundles as well as each flower sheathed with thin hyaline bracteoles ; calyx 5-cleft, red, somewhat fleshy ; petals 0 ; stamen 1, attached to the calyx-tube ; ovary ellipsoidal ; style central, elongated, shortly bifid at the apex ; utricle loose ; seed ellipsoidal, smooth. In sandy dry or moist places at the banks of the river Bero, plentiful but only at a very few spots ; fl. and fr. July 1859. No. **1088.** In rocky sparingly bushy places on the right bank of the river Caroca, near Cabo Negro ; fr. Sept. 1859. No. **1088***b*. A divaricate, branched undershrub, 2 ft. high ; stem nodose ; stipules scarious, the scales which involve the fruits fleshy, dusky. In sandy places at the banks of the river Bero ; fr. July 1859. Coll. Carp. 879.

2. **PARONYCHIA** Adans ; Benth. & Hook. f. Gen. Pl. iii. p. 15.

1. **P. illecebroides** Webb in Hook. Ic. Pl. viii. t. 756 (1848), and in Hook. Niger Fl. p. 106. t. 7 (1849) ; J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 275 (1852).

Herniaria illecebroides Chr. Sm. in Tuckey, Congo, p. 250 (1818).

Cape de Verde Islands.—At the maritime rocks and in sandy

hilly places, at Praia de Galê, Porto Grande, in the island of St. Vincent, plentiful; without fl. or fr. August 1853. No. **1067**. In the same neighbourhood, near the town of Mindello, plentiful; in fl. and fr. Jan. 1861. No. **1067***b*.

3. **SCLEROCEPHALUS** Boiss.; Benth. & Hook. Gen. Pl. iii. p. 17.

1. **S. arabicus** Boiss. Diagn. Pl. Or. Nov. i. fasc. 3, p. 12 (1843). *Paronychia sclerocephala* Decaisne in Ann. Sc. Nat. Ser. 2, iii. p. 262 (1835). *P. sclerocarpa* Steud. Nomencl. Bot. ii. p. 269 (1841). *S. Aucheri* Walp. Repert. v. p. 75 (1845); J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 276 (1852).

Cape de Verde Islands.—A prostrate, rigid, somewhat fleshy, apparently annual herb, with the habit nearly of *Illecebrum*; fruit echinate. In rocky maritime hilly places, covered with a volcanic sand, behind Villa de Mindello, in the island of St. Vincent, at Praia de Galé, sporadic and not at all plentiful; fl. and fr. Jan. 1861. No. **1091**.

This is possibly the low erect shrub, with thick almost cylindrical leaves, plentiful on the sandy seashore of the island of St. Vincent, without fl. or fr., mentioned by Welwitsch in Annaes Cons. Ultramar. Lisb., No. 7, August 1854, p. 79. n. 1.

CI. AMARANTHACEÆ.

Gomphrena globosa L., the "Perpetuas" of the Portuguese, is met with wild in all districts, both the variety with white flowers and that with purple ones. See Welw. Apontam. p. 547. n. 74.

1. **CELOSIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 24.

1. **C. trigyna** L. Mant. Pl. alt. p. 212 (1771).

Ambriz.—In woodlands at Quibanga; fl. and fr. Nov. 1853. No. **6557**.

Loanda.—By ponds near Quicuxe; fl. and fr. middle of July 1854. No. **6537**. An annual herb, at first erect and nearly simple, soon branched. By swamps near Quicuxe; fl. and fr. 7 Feb. 1859. No. **6560**. Leaves in old age deep red; flowering spikes small, silvery white. By dried-up swamps near Quicuxe, plentiful; fr. July 1854. Coll. Carp. 869.

Golungo Alto.—In poor fields near Cambondo; fl. and fr. No. **6562**.

Ambaca.—A small specimen, 5 in. high. In an excursion towards Puri-Cacarambola; fl. and fr. Oct. 1856. No. **6571**.

Huilla.—In fields after crops of *Sorghum* and *Mays*, very plentiful, among other Amaranthaceæ; fl. and fr. end of May 1860. No. **6485**.

2. **C. cristata** L. Sp. Pl., edit. 1, p. 205 (1753).

Loanda.—In fl. No. **6512***b*.

3. **C. Schweinfurthiana** Schinz in Engl. Bot. Jahrb. xxi. p. 178 (28 May 1895).

Golungo Alto.—An annual or biennial herb, usually somewhat woody at the base, ascending; branches divaricate, variously twisted; perianth pentaphyllous, whitish, somewhat closed or at the mouth only, somewhat spreading during the flowering; stamens 5, hypogynous, all fertile; filaments broader at the base and combined into a shallow

cup, then upwards gradually narrowed-acuminate, white; anthers cordate, attached at the middle of the back, 2-celled, longitudinally dehiscing, introrse, of a fine violet colour; ovary depressed-ovoid, green, 1-celled; ovules 6 or 7, each erect, with its own white funicle from the centre of the base of the ovary, subreniform; style 1, short, soon terminating in 2 stigmas or in one 2-branched stigma; the young utricle ovoid-truncate, a little compressed-flattened on the sides, greenish, surrounded by the perianth up to the middle, crowned at the apex with the black branches of the stigma. In moist shady places at the outskirts of the Querenge forests in the Queta mountains; fl. Jan. 1856. No. **6551**.

Pungo Andongo.—A branched herb of 2 to 4 ft., sometimes sub-erect, sometimes decumbent upon low shrubs; stems usually purplish; leaves alternate; flowers whitish; perianth-segments 5, equal; stamens 5, connate at the base into a cup; ovary spherical, 1-celled; stigma bifid. By moist thickets in the præsidium, rather rare; fl. beginning of Dec. 1856. No. **6569**. At the outskirts of the forest in damp places; fl. March 1857. No. **6563**.

4. **C. argentea** L., *l.c.*, p. 205.

Golungo Alto.—An erect or ascending herb; stem branched, 2 to 3 feet high; spikes dense, brilliantly whitish rosy. In moist sandy places at the banks of the river Cuango, not plentiful; fl. Aug. 1855. No. **6543**.

Pungo Andongo.—At Cazella: fr. Nov. 1856. Apparently this widely distributed species. Coll. Carp. 1082.

5. **C. laxa** Schum. & Thonn. in Danske Vidensk. Selsk. iii. p. 161 (1828).

C. loandensis Baker in Kew Bull. 1897, p. 277.

Loanda.—An annual herb, divaricately branched; the stem and patent branches purple; spikelets of flowers whitish-shining. In shrubby places from Nazareth to Penedo, plentiful; fl. and fr. Dec. 1858. Nos. **6558**, **6558***b*, **6537***b*.

Golungo Alto.—A subscandent herb, with its spikes in old age recalling those of *Statice reticulata*. At Quilanga; fr. June 1856. Coll. Carp. 873. In the primitive forest of Quilanga; fl. and fr. Dec. 1855 and end of June 1856. No. **6578**. A scandent herb, with sarmentose branches. At the outskirts of the forest near Capopa in Sobato de Bumba; fl. and fr. Feb., April and June 1856. No. **6577**. A herb of 3 to 7 ft.; stems weak, quasi-scandent on other plants; spikes compound, densely imbricate, whitish-shining. At the Capopa spring near Canguerasange; fr. Oct. 1854. Coll. Carp. 871. A widely climbing herb; spikes paniculate, very thick, obtuse, snow-white. At the Capopa cataract; fr. April 1856. Coll. Carp. 872. Near Trombeta; fl. and fr. Sept. 1857. No. **6578***b*.

Huilla.—At Mumpulla; in fr. No. **6495**.

I have not seen the type of this species; the thickness of the spikes varies greatly among the above Nos.; those belonging to the type of *C. loandensis*, No. 6537*b*, are comparatively slender.

6. **C. nana** Baker in Kew Bull. 1897, p. 277.

Pungo Andongo.—At Lombe; in fl. and fr. March 1857. Nos. **6566**, **6566***b*.

7. **C. Welwitschii** Schinz in Engl. Bot. Jahrb. xxi. p. 179 (1895).

Huilla.—Flowers white. In fields between Nene and Humpata;

fl. and fr. Dec. 1859 ; also in maize fields at Lopollo ; fl. and fr. May 1860. No. **6486** In fields near Eme in the Lopollo country ; fl. and fr. end of March 1860. No. **6490**.

8. **C. argenteiformis** Schinz in Engl. Nat. Pflanzenfam. iii. 1*a*, p. 100 (1893).

Hermbstædtia argenteiformis Schinz in Verh. Bot. Brandenb. xxxi. p. 209 (14 Jan. 1890). *Hermstædtia Welwitschii* Baker in Kew Bull. 1897, p. 278 (Sept.).

Mossamedes.—A slender, erect or decumbent-ascending, virgately branched, annual herb, 1 to 3 ft. high ; flowers white or sometimes whitish-rosy, in pyramidally arranged spikes. In sandy thickets among low bushes close to the banks of the river Bero, plentifully ; fl. and fr. July 1859 and June 1860. No. **6502**.

9. **C. staticodes** Hiern, sp. n.

A herb, 2 to 3 ft. high, puberulous on the young parts, turning dusky in the dry state ; leaves alternate, ovate, acuminate at the subobtuse apex, subtruncate or nearly rounded at or near the base, rather thin, slightly scabrid, repand-entire, 2 to 4 in. long by $\frac{5}{8}$ to $2\frac{1}{4}$ in. broad ; petiole $\frac{1}{3}$ to $1\frac{2}{3}$ in. long ; inflorescence like that of *Statice*, paniculate, pyramidal, terminal, bracteolate and somewhat bracteate or leafy especially below ; panicles about a foot long ; bracteoles paleaceous, ovate, $\frac{1}{24}$ to $\frac{1}{12}$ in. long ; ultimate pedicels very short or obsolete ; perianth-segments 5, white, rather dryly paleaceous, about $\frac{1}{10}$ in. long in flower, $\frac{1}{8}$ in. long in fruit, oval-oblong, spreading at the time of the flowering, inserted with the stamens at the outside of the base of the perigynous disk ; stamens 5, monadelphous, united at the base into a cup, free and narrowly subulate above, shorter than the perianth ; anthers oblong, 2-celled, attached at the middle of the back, dehiscing longitudinally, introrse ; ovary stipitate, obovoid and subtruncate in flower, ovoid-oblong in fruit, the stipe arising from the bottom of the perianth and penetrating the disk through a central hole ; style solitary, short, crowned with 2 spreading branches ; seeds 2, minutely tuberculate, comparatively dull.

Golungo Alto.—At the bushy outskirts of the primitive forest in Sobato de Mussengue on the left-hand side of the Ambaca road from Sange, very rare ; fl. and fr. 16 Dec. 1855. No. **6572**.

2. **AMARANTHUS** Tournef., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 28 (*Amarantus*).

1. **A. caudatus** L. Sp. Pl., edit. 1, p. 990 (1753).

Loanda.—An annual, erect herb, 2 to 3 ft. high, rarely branched ; leaves turning purplish before the flowering, edible when cooked ; flowers sometimes greenish, sometimes rosy-purple or nearly blood-red purple. Cultivated and frequently wild on rubbish heaps ; fl. July 1854 ; in sandy sunny places about Maianga d'El Rei, quite wild and apparently indigenous ; fl. July 1858 ; cultivated as a pot-herb in Dr. Mendes Alfonso's garden ; fl. and fr. August 1858. Negro name "Jimbõa." No. **6512**, *partly*.

Cazengo.—In the hot parts of the primitive forest of Mata de

Cabonda, plentiful; fl. and fr. middle of June 1855. Native name "Jimbôa." No. **6513**.

Golungo Alto.—In fl. and fr. No. **6513***b*.

2. **A. spinosus** L. Sp. Pl., edit. 1, p. 991 (1753); J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 176 (1852); Welw. in Ann. Cons. Ultramar. Lisb. No. 7 (August 1854) p. 84. n. 90.

Sierra Leone.—In fl. beginning of Sept. 1853. A poor specimen probably of this species, which, according to Welwitsch's note attached to no. 6515, he saw plentifully near Freetown but of which he collected only one specimen growing in kitchen gardens and afterwards suffering from the dampness of the winter. No. **6514**.

Ambriz.—On rubbish heaps near Banza d'Ambriz; also behind Quizembo; fl. and fr. end of Nov. 1853. No. **6515**.

Prince's Island.—Stem straight, reddish, mostly branched from the base. In plots neglected after cultivation and in sunny places, near the port of S. Antonio; fr. Sept. 1853. Coll. Carp. 867.

Cape de Verde Islands.—Island of San Thiago. Cultivated at Loanda in 1857. Coll. Carp. 868.

This is apparently the *Amaranthus*, amid masses of which *Acuan virgatum* Medik. grew sporadically by the lake near Banza d'Ambriz; see *ante* p. 309.

3. **A tricolor** L. Sp. Pl., edit. 1, p. 989 (1753).

A. gangeticus L. Syst. Nat. edit. 10, ii. p. 1268 (1759).

Loanda.—Cultivated in gardens, and according to Arsenio P. P. de Carpo called "Papagaios"; fl. and fr. No. **6516**.

Welwitsch was informed by Senhor Pompeio Pampilhio that this species occurs wild near Pungo Andongo. The name "papagaios" is also used by the Portuguese colonists for *Impatiens Balsamina* L.; see *ante* p. 108. It was also found in Ambaca, near N-gombe, in plots neglected after cultivation, where it was not plentiful, in Oct. 1856. According to a ms. note of Welwitsch, this is one of the species which are both wild and cultivated by the natives and which furnish the edible vegetables called by the negroes "Jimbôa." see Welw. Apontam. p. 547 sub n. 74 (1859), and Ficalho, Pl. Uteis, p. 242 (1884).

These vegetables are eaten in large quantities like beet sprouts by the natives in the interior, for example in the district of Duque de Bragança, where for weeks and even for months they eat scarcely anything else.

4. **A. græcizans** L. Sp. Pl., edit. 1, p. 990 (1753).

A. albus Thunb. Prodr. Pl. Cap. p. 45 (1794); non L. (1759). *A. Thunbergii* Moq. in DC. Prodr. xiii. 2, p. 262 (1849).

Pungo Andongo.—At Condo; fl. and fr. March 1857. No. **6522**.

Mossamedes.—An annual herb, branched from the base; branches slender; leaves variable, narrower or broader; flowers greenish. In gravelly places at Garganta do Rio Bero; fl. and fr. end of June 1859. In sandy places by the river Bero; fl. and fr. July 1859. In neglected fields between Hortas and Boa Vista; fl. and fr. July 1859. No. **6528**. An annual herb, erect or ascending; stem slender, bright green, branched from the base or from the middle; branches elongated, erect-patent. In damp sandy places at the mouth of the river Bero; fl. and fr. July 1859. A narrow-leaved variety. No. **6527**.

Huilla.—In fields after crops of Sorghum, plentiful; fl. and fr. beginning of May 1860. No. **6497**.

Perhaps only a variety of *A. Blitum* L.

5. **A. Blitum** L. Sp. Pl., edit. 1, p. 990 (1753).

Icolo e Bengo.—By the coast between the rivers Bengo and Dande; fl. and fr. Feb. 1854. No. **6523**.

Loanda.—At Cacuaco ; fl. and fr. 30 Dec. 1853. No. **6524**. An annual, prostrate or suberect herb, with a purple stem and purplish flowers. In seaside places at Praia da Zamba grande to the south-west of Loanda, here and there ; fl. and fr. May 1858. No. **6525**.

Golungo Alto.—In kitchen-gardens and in hot uncultivated places about Sange ; fl. and fr. Jan. 1855. No. **6521**.

Cazengo.—An annual herb ; stem strictly erect. In hot gravelly places at the base of mount Muxaûla, not common ; fl. and fr. June 1855. No. **6526**.

Cape de Verde Islands.—Island of St. Vincent ; in fl. Aug. 1853. Apparently this species. No. **6546** partly.

The rest of no. 6546 belongs to another plant ; it is without fl. or fr.

6. **A. viridis** L. Sp. Pl., edit. 2, p. 1405 (1763).

Euxolus caudatus Moq. in DC. Prodr. xiii. 2, p. 274 (1849).

Barra do Bengo.—In thin palm groves near Quifandongo ; fl. and fr. Dec. 1853. No. **6518**.

Loanda.—An annual, erect or decumbent-ascending herb, 1 to 2 ft. high, eaten by the negroes. In open places about dwellings near Maianga d'El Rei ; fl. and fr. August 1858. Negro name "Jinboa." No. **6512**, partly. A dull green, annual, erect herb, with spreading branches at the top ; flowering spikes from greenish to purplish. In sandy and gravelly places and by rubbish-heaps, everywhere and very plentiful especially in the neighbourhood of dwellings shortly after the December rains ; in the courtyard of Welwitsch's house in Loanda ; fl. and fr. end of Dec. 1858 ; in damp herbaceous places, at Imbondeira dos Lobos, and near Maianga do Povo ; fl. and fr. Feb. 1859. Eaten by the negroes together with other species of the genus, and called by them "Jinboa." No. **6517**.

Golungo Alto.—About Sange ; fl. and fr. Dec. 1854. No. **6519**. Edible ; fr. Feb. 1856. "Jimboa." Coll. Carp. 128.

Mossamedes.—An annual, erect, branched herb, 1 to 3 ft. high. In places neglected after cultivation and on gravel at the banks of the river Bero, plentiful ; fl. and fr. July 1859. No. **6520**.

This appears to be *Amaranthus* mentioned by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 7 (August 1854), p. 80. n. 19 as occurring at the banks of the river Bengo near S. Antonio, Dec. 1853.

3. **MARCELLIA** Baill. in Bull. Mens. Soc. Linn. Paris, i. p. 625 (1886); non Mart. (1844).

Sericocoma sect. Sericorema *partly*, Benth. & Hook. f. Gen. Pl. iii. p. 30.

1. **M. mirabilis** Baill., *l.c.*

Sericocoma Welwitschii Hook. f. in Benth. & Hook. f., *l.c.*; Schinz in Engl. Bot. Jahrb. xxi. p. 182 (1895); non Baker. *M. Welwitschii* Lopriore in Engl. Bot. Jahrb. xxvii. p. 40, t. i. fig. C (7 April 1899).

Mossamedes.—An annual herb, branched from the base ; branches ascending ; flowers greenish rosy blood-red. In sandy thickets at the river Bero, sporadic and apparently very rare ; fl. and fr. July, Aug., and Sept. 1859. No. **6508**. Leaves linear, deep green ; flower-spikes

elongated, brilliantly purple. In sandy places at the river Bero near Cavalheiros ; fl. and fr. beginning of July 1859. Coll. Carp. 874.

2. **M. denudata** Lopriore, *l.c.*, p. 41.

Sericocoma denudata Hook. f., *l.c.* ; Schinz in Engl. Bot. Jahrb. xxi. p. 182 (1895).

Mossamedes.—An erect, slender undershrub, 2½ to 4 ft. high ; branches virgate ; flowers whitish. In gravelly maritime places near Mossamedes, very plentiful but only in a few spots, in company with *Vogelia africana* Lam. (cf. Welw. Coll. Carp. 95 ; *ante*, p. 635) ; fl. and fr. July and August 1859. No. **6503**.

4. **CYPHOCARPA** Lopriore in Engl. Bot. Jahrb. xxvii. p. 42 (7 April 1899).

Sericocoma sect. Kyphocarpa, Fenzl in Linnæa xvii. p. 324 (1843) ; Benth. & Hook. f. Gen. Pl. iii. p. 30.

1. **C. angustifolia** Lopriore, *l.c.*, p. 45.

Cyathula angustifolia Moq. in DC. Prodr. xiii. 2, p. 328 (1849). *Sericocoma angustifolia* Hook. f. in Benth. & Hook. f. Gen. Pl. iii. p. 30. *S. Chrysurus*, var. *angustifolia* Moq. ex Hook. f., *l.c.* ; non Meisn. (1843).

Huilla.—In thickets at the borders of fields in the Lopollo country, rare ; fl. and fr. end of Jan. 1860. No. **6489**.

The following has fruits like this species, but the description of the stem, etc., does not agree :—

Mossamedes.—A perennial, suffruticose, much-branched herb ; stem etc. velvety-tomentose ; flowers spicate, white-greenish ; fruits wrapped in close wool. Between Aguados and Cavalheiros ; fl. and fr. July 1859. Coll. Carp. 875.

5. **SERICOCOMOPSIS** Schinz in Engl. Bot. Jahrb. xxi. p. 184 (28 May 1895).

Sericocoma Benth. & Hook. f. Gen. Pl. iii. p. 30, *partly*.

1. **S. Welwitschii** Lopriore in Engl. Bot. Jahrb. xxvii. p. 42, t. 1, fig. E (7 April 1899).

Sericocoma Welwitschii Baker in Kew Bull. 1897, p. 278 (Sept.) ; non Hook. f.

Mossamedes.—An erect, annual herb, 1 to 2 ft. high ; flowers somewhat rigid, white-glumaceous. In sandy places at the river Bero, rather rare ; fl. and fr. July 1859. No. **6501**.

6. **CENTEMA** Hook. f. in Benth. & Hook. f. Gen. Pl. iii. p. 31.

1. **C. angolensis** Hook. f., *l.c.*

Loanda.—At Alto das Cruzes ; fl. and fr. Feb. 1858. No. **6538**.

2. **C. biflora** Schinz in Engl. Bot. Jahrb. xxi. p. 183 (28 May 1895), and in Engl. Pfl. Ost Afr., C., p. 172 (19 July 1895).

Psilotrichum rubellum Baker in Kew Bull. 1897, p. 279.

Huilla.—Flowers blood-red. In wooded mountainous places in Morro de Lopollo ; fl. and fr. April 1860. No. **6509**. An annual, erect, branched, slender herb, with linear leaves and cylindrical blood-red purple spikes of flowers. In Morro de Lopollo ; fl. and fr. April

and May 1860. Coll. Carp. 876. A perennial?, erect, branched herb, 2 ft. high; leaves narrow; spikes blood-red purple. At Mumpulla; fl. and fr. June 1860. Coll. Carp. 105.

3. **C. gracilenta** Hiern, sp. n.

An annual, erect, branched herb, about 2 to 3 ft. high or more, glabrous in most parts; stem purplish at the base, from the middle to the apex herbaceous-green and angular-furrowed; branches slender; nodes marked with a transverse somewhat hairy line between the leaves; leaves opposite with fasciculate mostly smaller leaves in their axils, narrowly spathulate-linear, pointed at the apex, attenuate to the sessile base, entire, $1\frac{1}{2}$ to 2 in. long by $\frac{1}{30}$ to $\frac{1}{12}$ in. broad; lateral margins more or less revolute; midrib broad; flowers spicate, yellow-greenish, $\frac{1}{12}$ in. long; bracts 3, of which two adhere to the perianth even in the dry state and the third often remains on the axis of the spike, all ovate thin and reaching about halfway up the flower, the third larger than the others and somewhat woolly; spikes terminal, slender, dense, 2 to $2\frac{1}{2}$ in. long; perianth hard, the segments 5, oval-oblong, longitudinally nerved, $\frac{1}{12}$ in. long, obtuse, paleaceous, united and rather thickly cartilaginous at the base, glabrous or nearly so; filaments 5, subulate, weak, united below into a shallow membranous cup, glabrous; staminodes 0; anthers small; androecium about equalling the perianth; pistil $\frac{1}{16}$ in. long, nearly but not quite glabrous; ovary ovoid, unilocular, $\frac{1}{24}$ in. long; ovule solitary; style short, unbranched; fruit $\frac{1}{10}$ in. long, nearly glabrous, ovoid-conical; seed solitary, comparatively large; embryo large, annular.

Huilla.—In sandy wooded places on the Humpata plateau; fl. and fr. 21 March 1860. No. **6511**.

7. **DESMOCHÆTA** DC. Cat. Hort. Monspel. p. 101 (1813), *partly*.

Cyathula Blume, Bijdr. Fl. Ned. Ind. (xi.) p. 548 (1825); Benth. & Hook. f. Gen. Pl. iii. p. 31; non Lour. (1790). *Pupalia* Mart. Nov. Gen. & Sp. Pl. Brasil. ii. p. 60. tt. 156, 158 (1826); non Juss. (1803).

The type of Loureiro's plant is in the National Herbarium; it belongs to *Achyranthes*; the species is *A. aspera* L.

1. **D. prostrata** DC., *l.c.*, p. 102.

Achyranthes prostrata L. Sp. Pl. edit. 2, p. 296 (1762). *D. micrantha* DC., *l.c.* *Cyathula prostrata* Blume, *l.c.*, p. 549; Moq. in DC. Prodr. xiii. 2, p. 326 (1849), excl. syn. Loureir.

Golungo Alto.—A very slender, ascending herblet, with greenish flowers and fruits. In Mata de Quisuculo between Sobato Bango and Quilombo, rather rare; fl. and fr. April 1856. No. **6550**. In shady forests by streams at Quilombo; fl. and fr. June 1856. No. **6579**.

Prince's Island.—In the coast region; fl. and fr. Sept. 1853. No. **6540**.

2. **D. uncinulata**.

Achyranthes uncinulata Schrad. Ind. Sem. Hort. Goett. 1833, p. 1. *Cyathula globulifera* Moq. in DC. Prodr. xiii. 2, p. 329 (1849).

Pungo Andongo.—An extensively but not high climbing herb or a widely climbing undershrub of 3 to 6 ft.. apparently rather rarely flowering ; stems divaricately intertwined with other shrubs ; flowers whitish, clustered in long or ellipsoidal pale whitish straw-coloured heads. In the wooded thickets of the præsidium, plentiful, in Mata de Cambondo, fl. and fr. Dec. 1856 ; by thickets in the small primitive forest of Cabondo, rather rare, fl. and fr. April 1857 ; also in Mata de Pungo by streams, fl. and fr. beginning of June 1857. No. **6564**.

3. **D. distorta** Hiern, sp. n. .

An undershrub, 2 to 3 ft. high, bent and twisted in various directions ; branches rigid, smooth, glabrate, subterete, drab ; branchlets hispid-pubescent with pallid ascending hairs ; leaves opposite and often quasi-fasciculate with abbreviated leafy shoots in their axils, broadly ovate or oval, obtuse or subcuspidate at the apex, obtuse or slightly wedge-shaped at the base, more or less clothed on both faces with sub-adpressed slender hairs arising from a thicker base, entire or nearly so, firmly herbaceous, yellowish green in the dry state, $\frac{3}{4}$ to $1\frac{1}{4}$ in. long by $\frac{1}{2}$ to $\frac{2}{3}$ in. broad ; petiole $\frac{1}{5}$ to $\frac{1}{4}$ in. long, hispid-pubescent ; inflorescence capitate, subsessile, ovoid-conical, $\frac{3}{8}$ to $\frac{2}{3}$ in. long by $\frac{1}{5}$ to $\frac{3}{8}$ in. in diameter near the base, terminating the branchlets and lateral shoots ; partial inflorescence 2-flowered, bracteolate ; bracteoles broadly ovate, concave, boat-shaped, scarious except the hairy keels of the outer ones, minutely ciliolate-fringed, $\frac{1}{8}$ to $\frac{1}{6}$ in. long ; perianth-leaves 5, lanceolate-oblong, concave, feebly ribbed, $\frac{1}{8}$ to $\frac{1}{6}$ in. long, pilose at the back above, rather dusky towards the base ; stamens 5 ; filaments slender, united at the base in a very short tube or cup, longer than the short quadrate or oblong alternating stamino-des ; style slender, glabrous, exceeding the stamens.

Huilla.—In wooded thickets at Lopollo ; fl. and fr. beginning of Feb. 1860. No. **6487**.

8. **PUPAL** Adans. Fam. Pl. ii. p. 268 (1763), excl. syn. Rheed. Hort. Malab. vii. t. 43.

Pupalia Juss. in Ann. Mus. Par. ii. p. 132 (1803), excl. syn. Rheed. H. M. ; Benth. & Hook. f. Gen. Pl. iii. p. 31, excl. syn. *Syama* ; non Mart. (1826). *Desmochæta* DC. Cat. Hort. Monspel. p. 101 (1813), *partly*.

The plant of Rheede, *l.c.*, which is *Syama* Jones in Asiat. Res. iv. p. 261 (1795), by mistake printed *Lyama* and inaccurately quoted in Hook. f. Fl. Brit. Ind. iii. p. 669 (1882), is (excluding the fruit) *Ichnocarpus frutescens* R. Br.

1. **P. lappacea** Juss., *l.c.*, (*Pupalia*), excl. syn. Rheed. Hort. Malab. vii. t. 43.

Achyranthes lappacea L. Sp. Pl. edit. 1, p. 204 (1753). *Desmochæta flavescens* DC., *l.c.*, p. 102.

Ambriz.—In fl. and fr. Nov. 1853. No. **6529***b*.

Barra do Bengo.—An erect herb, 2 to 4 ft. high, with erect-patent branches, flowering from February to June ; the lateral branches

flowering and the primary stem fruiting. In low dense thickets between Quifandango and Barra do Bengo; fl. and fr. May 1854. (Also in the district of Loanda.) No. **6529**.

Golungo Alto.—A grey-green, erect herb, 2 to 3 ft. high, with quite patent somewhat rigid branches and from whitish to greenish flower-spikes. In the wooded parts of the primitive forest of Quibanga; fl. and fr. April 1856. No. **6552**.

Mossamedes.—An erect, annual herb. In sandy thickets at the river Bero; only one specimen collected, 8 in. high; in fr. July 1859. Perhaps this species. No. **6500**.

2. **P. huillensis** Hiern, sp. n.

A rigid, divaricately branched herb, 2 ft. high or more; branches opposite, subterete, glabrescent; branchlets tetragonal, furrowed; leaves opposite, oval or broadly ovate, rounded or shortly narrowed at the apex, obtuse or somewhat wedge-shaped at the base, herbaceous, more or less clothed with adpressed scattered hairs on both faces, rather paler beneath, shortly ciliate on the entire subrepand or slightly crenulate-undulate margins, $\frac{3}{4}$ to 2 in. long by $\frac{3}{8}$ to $1\frac{1}{4}$ in. broad; petiole $\frac{1}{6}$ to $\frac{1}{2}$ in. long; inflorescence dense, capitate, subglobose or ovoid-oblong, $\frac{3}{8}$ to $1\frac{1}{4}$ in. long, $\frac{3}{8}$ to $\frac{2}{3}$ in. in diameter, pedunculate, terminal and in the uppermost axils; the terminal common peduncles ranging up to 2 in. long, the axillary ones very short; flowers polygamous or monœcious, clustered, 2 or 3 or several together, pentamerous, sessile or subsessile, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, some abortive; bracteoles oval, terminating in a long subulate apiculus, hooked at the tip, concave, boat-shaped, hyaline, equalling or exceeding the flowers; perianth-segments 5, oval-oblong, $\frac{1}{6}$ to $\frac{1}{4}$ in. long, paleaceous or scarious, some or all apiculate; stamens 5; filaments slender, united in a short cup below; anthers about as long as the free portion of the filaments; staminodes 0; style long, slender, longer than the stamens, shorter than the perianth; ovary glabrous; ovule solitary, pendulous.

Huilla.—Among tall bushes, near Lopollo, towards the Monino, sporadic; fl. and fr. Feb. 1860. No. **6493**.

9. **NOTHOSÆRVA** Wight; Benth. & Hook. f. Gen. Pl. iii. p. 34. (*Nothosœrua*).

1. **N. brachiata** Wight, Ic. vi. p. 1 (1853).

Achyranthes brachiata L. Mant. Pl. p. 50 (1767). *Illecebrum brachiatum* L. Mant. Pl. alt. p. 213 (1771). *Aërva brachiata* Mart. in Acad. Cæs. Leop. Nova Acta xiii. p. 291 (1826). *Pseudanthus brachiatus* Wight, Ic. v. 2, p. 3 (1852), vi. t. 1776 *bis* B (1853).

Barra do Bengo and Loanda.—An annual herblet, erect or ascending, with usually purplish stems and silvery white flower-spikes. In moist places at the banks of the river Bengo near Santo Antonio; fl. and fr. Dec. 1853; at Represa do Senhor Manuel Pereira van Hunnen, fl. and fr. beginning of July 1854 and in Aug.; by dried-up ponds between Quicuxe and Mutollo, fl. and fr. July 1854; at Imbondeiro dos Lobos, fl. and fr. Feb. 1858. No. **6534**.

10. **OURET** Adans. Fam. Pl. ii. p. 268 (1763).

Ærva Forsk.; Benth. & Hook. f. Gen. Pl. iii. p. 34 (*Ærua*). *Uretia* O. Kuntze, Rev. Gen. Pl. ii. p. 544 (1891).

1. **O. persica** O. Kuntze, *l.c.* (*Uretia*), *partly*.

Ærva tomentosa Forsk. Fl. Ægypt.-Arab. pp. cxxii. 170 (1775). *Iresine javanica* Burm. Fl. Ind. p. 212 (312), t. 65. fig. 2 (1768). *I. persica* Burm., *l.c.*, p. 212 (312), t. 65. fig. 1. *Æ. ægyptiaca* Gmelin, Syst. Nat. ii. p. 1026 (1791). *Æ. javanica* Juss. in Ann. Mus. Paris, xi. p. 131 (1808); J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 175 (1852). *Achyranthes tomentosa* Chr. Sm. in Tuckey, Congo, p. 249 (1818).

Cape de Verde Islands.—In neglected fields, very plentiful, in company with "Bombardeira" (*Calotropis procera* Ait., Welw. herb. no. 4180 and Coll. Carp. n. 21; *ante* p. 687), near Villa da Praia in the island of St. Jago; fl. and fr. Jan. 1861. No. **6545**. A herb, apparently annual; stems branched, ascending, 1 to 3 ft. high and more; flower-spikes paniculate, silvery-woolly. In the islands of St. Jago and St. Vincent; fl. and fr. Jan. 1861. Coll. Carp. 122.

2. **O. scandens**.

Ærva scandens Wall. List, p. 231, n. 6911 (1832?); Moq. in DC. Prodr. xiii., 2, p. 302 (1849). *Achyranthes scandens* Roxb. Fl. Ind., edit. Carey, ii. p. 503 (1824). *Uretia sanguinolenta* O. Kuntze, *l.c.*, *partly*.

Bumbo.—At the margins of fields of *Saccharum*, plentiful; fl. and fr. Oct. 1859. No. **6496**.

3. **O. lanata**.

Achyranthes lanata L. Sp. Pl., edit. 1, p. 204 (1753). *Ærua lanata* Juss., *l.c.* *Uretia persica* O. Kuntze, *l.c.*, *partly*.

Golungo Alto.—A herb, 1 to 4 ft. high, sometimes strictly erect, in other cases climbing among bushes with its almost tomentose stem; flower-spikes snow-white, shining. In damp shady places by thickets and in rocky places at the river Cuango near Cacarambola and Cacuzo; fl. and fr. Jan. 1855. No. **6575**. In fl. and fr. 25 Sept. 1854. Coll. Carp. 870.

Huilla.—In plantations of maize near Eme; fl. and fr. Dec. 1859; in places flooded in the summer (elevations in the forest); fl. and fr. Feb. 1860. No. **6494**.

11. **ACHYRANTHES** L.; Benth. & Hook. f. Gen. Pl. iii. p. 35.

Cyathula Lour. Fl. Cochinch. p. 101 (1790); nec Blume (1825); nec Benth. & Hook. f.

1. **A. aspera** L. Sp. Pl., edit. 1, p. 204 (1753).

A. argentea Lam. Encycl. Méth. i. p. 545 (1783). *Cyatula geniculata* Lour. *l.c.*, p. 102.

Loanda.—By fences and thickets throughout the district, plentiful; in bushy places near Forte de Penedo, not far from the ocean; fl. and fr. end of April 1854. Nos. **6530**, **6530***b*.

Golungo Alto.—An annual and biennial herb; adult stems mostly prostrate, with ascending branches and lateral flowering branchlets quite patent. By thickets near Sange, plentiful; fl. and fr. June 1856.

A variety with purple anthers and the cup of the monadelphous filaments deep rosy. No. **6548**. An annual or biennial, prostrate or erect herb, paler throughout than the last No. By thickets behind the village of Sange, plentiful ; fl. and fr. June 1856. A variety with the cup of filaments white. No. **6547**. An erect herb, 2 to 3 ft. high, with whitish flowers. In grassy secondary thickets near Bango ; fl. and fr. May 1856. No. **6576**. In wooded thickets near Catumba ; fr. July 1856. An old plant. No. **6574**. About Bumba ; fl. and fr. No. **6573**. In fl. and fr. No. **6552***b*.

Mossamedes.—An annual herb, 2 to 3 ft. high, with numerous stems from the base, patently branched ; flower-spikes whitish rosy. In bushy places by the banks of the river Bero, at Fazenda do Senhor Viana ; fl. and fr. Aug. 1859. No. **6499**.

Huilla.—At Lopollo ; fl. end of March 1860. No. **6510**. In the Monino wooded thickets, sparingly ; fl. and fr. Jan. 1860. Root thin, elongated, fibrous, annual. No. **6492**.

This plant is perhaps the herbaceous Amaranthacea, with sordid-white spicate flowers, referred to by Welwitsch in Ann. Cons. Ultramar. No. 7, Aug. 1854, p. 83. n. 82, as occurring in thickets near Loanda in Jan. 1854.

2. **A. bidentata** Blume, Bijdr. Fl. Ned. Ind. (xi.) p. 545 (1825).

Golungo Alto.—An erect herb, 2 to 4 ft. high, with erect-spreading branches ; flower-spikes greenish, dusky-purple towards the apex, shining. In the primitive forests of the Queta mountains, above N-delle, rather rare ; fl. and fr. May 1856. No. **6544**.

Perhaps only a variety of the previous species.

12. **PANDIAKA** Benth. & Hook. f. Gen. Pl. iii. p. 35.

Achyranthes, sect. Pandiaka, Moq. in DC. Prodr. xiii. 2, p. 310 (1849).

1. **P. Heudelotii** Jacks. Ind. Kew. ii. p. 409 (1894).

Achyranthes Heudelotii Moq. in DC. Prodr. xiii. 2, p. 310 (1849).

Pungo Andongo.—In Pedras de Guinga ; fl. and fr. No. **6565**. At Candumba on the river Quanza ; fl. and fr. Nos. **6568**, **6568***b*.

A. angustifolia Benth. in Hook. Niger Fl. p. 492 (1849) is, perhaps, not distinct.

2. **P. debilis**.

Psilotrichum debile Baker in Kew Bull. 1897, p. 279 (Sept.).

Pungo Andongo.—In Pedras de Guinga ; fl. and fr. No. **6570**.

3. **P. Welwitschii**.

Achyranthes Welwitschii Schinz in Engl. Bot. Jahrb. xxi. p. 187 (1895).

Huilla.—At Lopollo ; fl. and fr. Dec. 1859. No. **6488**.

The following No. is, probably, a monstrous state of this species :—

Huilla.—A perennial herb ; stems crowded, oblique or erect ; leaves bright green above, paler beneath ; flower-spikes whitish. In moist thickets near Humpata ; in imperfect fl. April 1860. No. **6491**.

4. **P. ramulosa** Hiern, sp. n.

Rootstock woody, polycephalous ; branches pubescent, pallid, slender, herbaceous ; branchlets numerous, rather erect than

patent; leaves opposite, oval-oblong, cuspidate at the apex, somewhat wedge-shaped at the subsessile base, 1 to $1\frac{1}{4}$ in. long by $\frac{1}{4}$ to $\frac{1}{3}$ in. broad, sparingly pubescent, firmly herbaceous, pale yellowish green, ciliolate on the entire or subrepand margin; inflorescence ovoid-globose, $\frac{1}{2}$ to $\frac{2}{3}$ in. long by $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter, shortly stalked, terminating the branchlets and in the upper axils, whitish; flowers sessile or subsessile, $\frac{1}{5}$ in. long, each based with three erect imbricate ovate-cymbiform subulate-acuminate subscarious ciliate bracteoles $\frac{1}{6}$ to $\frac{1}{4}$ in. long, not reflected; perianth-segments 5, lanceolate-oblong, concave, thickly paleaceous, scarious on the margins, ribbed on the back below but not strongly so, pubescent on the back above, glabrous inside, obtuse or apiculate at the apex, somewhat obtusely narrowed at the base, imbricate, $\frac{1}{6}$ to $\frac{1}{5}$ in. long, the outer ones rather longer than the inner ones; stamens 5; filaments slender, $\frac{1}{16}$ in. long, united in a short tube at the base, anthers oblong, 2-celled, $\frac{1}{27}$ in. long; staminodes 5, oblong, $\frac{1}{24}$ in. long, $\frac{1}{30}$ in. broad, truncate-crenulate at the apex, alternating with the filaments and arising from the same short tube; pistil $\frac{1}{8}$ in. long, glabrous; style $\frac{1}{16}$ in. long, rather thickening upward; ovule solitary, pendulous.

Huilla.—In rough places near Mumpulla; fl. and fr. Oct. 1859. No. **6498**.

5. **P. andongensis** Hiern, sp. n.

An erect, divaricately branched, pubescent, annual herb, 1 ft. high or more; branches opposite; branchlets hirsute with long pallid spreading hairs; leaves elliptical or obovate, subacute at the apex, wedge-shaped to or near the sessile base, thinly herbaceous, somewhat strigose-silky, green above, rather paler and minutely punctulate beneath, opposite, entire, $1\frac{1}{4}$ to $2\frac{1}{2}$ in. long by $\frac{1}{2}$ to 1 in. broad; flower-spikes (rather young) terminal, shortly stalked, more than 1 in. long by $\frac{3}{8}$ in. in diameter, bracteate, dense, ovoid-conical; flowers not reflected; bracts ovate-lanceolate, acute, bristle-pointed, mostly glabrous, paleaceous, $\frac{1}{8}$ in. long; perianth-segments 5, lanceolate, acute, bristle pointed, light green hairy and nerved at the back, pallid glabrous and smooth inside, thickly glumaceous, $\frac{1}{6}$ to $\frac{1}{5}$ in. long; stamens 5; filaments slender, glabrous, $\frac{1}{12}$ in. long, united at the base into a very short thin cup; anthers $\frac{1}{40}$ in. long; staminodes 5, alternating with the filaments, short, ovate-deltoid, acute, thin; pistil $\frac{1}{8}$ in. long, glabrous; style $\frac{1}{10}$ in. long, slender, undivided; stigma capitate, small; ovule solitary, pendulous.

Pungo Andongo.—In young fl. Dec. 1856. No. **6567**.

13. **ALTERNANTHERA** Forsk.; Benth. & Hook, f. Gen. Pl. iii. p. 38.

Telanthera R. Br.; Benth. & Hook. f., *l.c.* *Bucholzia* Mart. Nov. Gen. ii. p. 49. tt. 147-51 (1826); non Stadtm. (1796).

1. **A. maritima** St. Hil. Voy. Bres. ii. p. 437 (1833); non D. Dietr. (1839).

Bucholzia maritima Mart., *l.c.*, p. 50, t. 147. *Telanthera maritima* Moq. in DC. Prodr. xiii. 2, p. 364 (1849).

Ambriz.—In fl. and fr. Nov. 1853. No. **6553**.

Loanda and Barra do Dande.—In sandy maritime places from Praia de Penedo as far as Ambriz ; at Praia de San Thiago, fl. and fr. Sept. 1858. No. **6559**. On the sea coast of the island of Cazanga ; fl. and fr. Oct. 1858. No. **6535**.

2. **A. achyranthoides** Forsk. Fl. Ægypt.-Arab. pp. lix. 28 (1775). *Gomphrena sessilis* L. Sp. Pl., edit. 1, p. 225 (1753). *Illecebrum sessile* L., *l.c.*, edit. 2, p. 300 (1762). *A. repens* W. Wood in Rees, Cyclop. i. (1802). *A. sessilis* Roem. & Schultes, Syst. Veg. v. p. 554 (1819).

Libongo.—An annual, prostrate herb ; stems usually rooting at the nodes, but little succulent ; leaves lanceolate- or obovate-elliptical, membranous, green ; flowers white. At the sandy banks of the river Lifune, near Banza de Libongo ; fl. and fr. Sept. 1858. No. **6555**.

Barra do Dande.—A herb ; rootstock polycephalous ; stems prostrate-ascending, purple, somewhat fistulose, sparingly branched ; flowers whitish. In swampy places about lakes on the right bank of the river Dande near Bombo, sparingly ; fl. and fr. Sept. 1858. No. **6533**.

Icolo e Bengo.—In damp places at the river Bengo, near Quifandango ; fl. and fr. Dec. 1853. No. **6531**. A diffuse herb ; branches ascending, occasionally rooting at the nodes ; flowers snow-white. At the marshy edges of Lagoa de Foto, rather rare ; fl. and fr. Sept. 1857. No. **6532**.

Golungo Alto.—Flower-heads snow-white. Close to the banks of the river Quiapoze and by nearly dried-up ponds. No. **6549**. On maize lands near Quibixe ; fl. and fr. June 1856. No. **6561**.

Mossamedes.—In damp sandy places at the banks of the river Caroca near Cabo Negro ; fl. and fr. Sept. 1859. No. **6505**. In damp places at the river Maiombo near Pomangala ; fl. and fr. Oct. 1859. No. **6504**.

Prince's Island.—In the coast region ; fl. and fr. middle of Sept. 1853. No. **6539**. A dwarf plant, sometimes rooting at the lower nodes ; perhaps this species ; rather like *A. nana* R. Br., but less pubescent ; fr. Sept. 1853. No. **6542**.

The type of Forskål's species is in the National Herbarium.

3. **A. echinata** Sm. in Rees, Cyclop. suppl., n. 10 (Dec. 1818). *Achyranthes repens* L. Sp. Pl., edit 1, p. 205 (1753). *Illecebrum Achyrantha* L., *l.c.*, edit. 2, p. 299 (1762). *Alternanthera Achyrantha* Roem. & Schultes, Syst. Veg. v. p. 557 (Sept. 1819). *Alternanthera* sp., Ficalho, Pl. Uteis, p. 242 (1884).

Loanda.—A prostrate herb, annual and also biennial ; the stems branches and leaves lying flat on the ground ; fruit prickly ; prickles very sharp, rigid, penetrating, very unfortunately so for those who walk about with bare feet. In open sunny and rather dry places everywhere, especially plentiful in streets and public squares ; in the courtyard of the governor's palace at Loanda ; fl. and fr. May 1854 and Dec. 1857. No. **6536**. At Maianga do Rei ; fl. and fr. July 1854. Negro name, "Madeat n-gombe." No. **6536***b*.

Golungo Alto.—In rather dry, swampy places near Camilungo ; fl. and fr. Oct. 1855. No. **6556**.

Prince's Island.—In the coast region ; fl. and fr. middle of Sept. 1853. No. **6541**.

14. **PHILOXERUS** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 40.

1. **P. vermiculatus** Sm. in Rees, Cyclop. xxvii. n. 3 (1814).

Gomphrena vermicularis L. Sp. Pl., edit. 1, p. 224 (1753). *Illecebrum vermiculatum* L. Sp. Pl., edit. 2, p. 300 (1762). *G. aggregata* Willd. Enum. Pl. p. 294 (1809). *P. aggregatus* H. B. & K. Nov. Gen. & Sp. Pl. ii. p. 203 (1817). *P. vermicularis* Pal. Beauv. Fl. Ow. ii. p. 65. t. 98 (1818). *Iresine vermicularis* Moq. in DC. Prodr. xiii. 2, p. 340 (1849). *I. aggregata* Moq., *l.c.*

Loanda.—In fl. and fr. Nos. **6538***b*, **6554**. There is no note with the former No.; that found with the latter cannot belong to this species but perhaps to No. 5567 or 5568 *partly* (*Ocimum americanum* Mill.).

Mossamedes.—In maritime places by rocks near Praia da Amelia; fl. and fr. July 1859. No. **6507**. In moist sandy places close to the river Bero then quite dry; fl. and fr. Aug. 1859. No. **6506**. In moist sandy places close to the river Caroca, by Cabo Negro; fl. and fr. Sept. 1859. No. **6506***b*.

CII. CHENOPODIACEÆ.

This Order is not found to be numerous in Angola; just as the Cruciferæ are represented or replaced in tropical regions by the Capparideæ, so are the Chenopodiaceæ by the Amaranthaceæ. *Chenopodium graveolens*, however, occurs in the interior on the plateau between Pungo Andongo and Condo and on the sandy forest slopes towards the Cuanza river, and sometimes in such masses that they exercise a wonderful influence on the appearance of those sandy steppes and are visible from a considerable distance on account of the blood-red colouring of their stems and leaves as well as their flowers. Not less plentifully does *Arthrocnemum macrostachyum* occur at the tidal mouths of some rivers between Ambriz and Rio Onço; its colour is typically herbaceous-green, but when the salt water begins to dry and evaporate it sometimes turns violet or peach-red, and covering as it does the surrounding lowlands it then affords a striking and lovely prospect from the neighbouring high ground, along which the road through the Mossul country runs; it stains everything violet.

Basella alba L., an herbaceous climber with fleshy leaves, is cultivated, though rarely, in some gardens, in Loanda and Golungo Alto, under the name of "Batavia." Not less frequent is the cultivation of spinach (*Spinacia oleracea* L.). See Welw. Apontam. p. 547. n. 73.

1. **CHENOPODIUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 51.

1. **C. opulifolium** Schrad. ex DC. Fl. Fr. v. p. 372 (1815).

Var. **betulifolium** Murr in Deutsche Bot. Monatsschrift, xii. p. 65 (1894); & Herb. Norm. edit. Dörfler, n. 3222 (1895).

Pungo Andongo.—By roadsides in the præsidium, in company with *C. ambrosioides* L. (Welw. no. 6315) and Urticaceæ, rather rare; without fl. or fr. Feb. 1857. No. **6324**.

Mossamedes.—An annual or biennial herb, 5 to 6 ft. high, virgately branched from the base ; the leaves, especially the fresh ones, glaucescent-green. In fields, neglected after cultivation, about the mouth of the river Giraûl, probably introduced ; fl. and fr. July 1859. No. **6323**.

The following No., which is without flowers or fruits, has larger leaves with obtuse teeth or small lobes ; it possibly belongs to this species :—

Mossamedes.—In sandy seaside places between Cabo Negro and Mossamedes, at Cazimba, seen nowhere else in Benguella : Sept. 1859. No. **6326**.

2. **C. murale** L. Sp. Pl. edit. 1, p. 219 (1753) ; J. A. Schmidt, Beitr. Fl. Cap Verd. p. 172 (1852).

Ambriz.—At Mubango ; fl. and fr. Nov. 1853. No. **6312**.

Loanda.—The whole plant, especially when rubbed, emits the unpleasant smell of some species of this genus ; leaves somewhat fleshy, brittle, very mealy especially beneath ; stem mostly ascending, obtusely angular, shining, longitudinally marked with red vittæ, 2 ft. or sometimes 6 ft. high or more ; flowering branches brittle ; seeds nearly smooth, somewhat glossy. By field hedges and on rubbish heaps about the city, never plentiful ; fl. and fr. July 1854 and 1858. No. **6309**. In vegetable gardens near Santo Antonio at the river Bengo ; fl. and fr. Dec. 1859. No. **6310**.

Cape de Verde Islands.—On rocks near Villa da Praia, in the island of St. Thiago ; fl. and fr. Jan. 1861. No. **6311**.

3. **C. ambrosioides** L. Sp. Pl. edit. 1, p. 219 (1753) ; Welw. Apontam. p. 547. sub. n. 73 (1859) ; Ficalho, Pl. Uteis, p. 243 (1884).

Loanda and Barra de Dande.—Among rubbish in cultivated places and in neglected plots after cultivation, also in damp grassy spots, everywhere, on the right banks of the rivers Lifune and Dande ; at Bombo on calcareous hills ; fl. and fr. Sept. 1858. No. **6314**.

Golungo Alto.—In fl. No. **6315***b*.

Pungo Andongo.—In fl. No. **6315**.

Mossamedes.—In moist sandy places near the rivers Bero and Giraûl, plentiful ; fl. July and Aug. 1859. No. **6313**.

Prince's Island.—In the coast region at Santo Antonio ; fl. Sept. 1853. No. **6316**.

This is the "Herva formigueira" and the "Herva de Santa Maria" of the Portuguese colonists ; it is used by the natives as a tonic remedy in the curative treatment of dysentery and of the dysenteric disease called "macûla" or "maculo." It is commonly biennial or triennial according to Welwitsch, though it is often described as annual ; see Monteiro, Angola, ii. pp. 250 to 252 (1875).

4. **C. graveolens** Lag. & Rodr. in Anal. Cienc. Nat. v. No. 13, p. 70 (1802) ; non Willd. (1809).

C. fœtidum Schrad. in Ges. Naturf. Fr. Berl. Mag. ii. p. 79 (1808) ; non Lam. (1805).

Pungo Andongo.—An annual, erect herb, 2 to 2½ ft. high, the whole plant in the living state very pleasantly purplish and very fragrant, conspicuous from afar as it grows in the quite white sand ; flowers greenish purple. In sandy wooded places between Luxillo and Cazella ; fl. and fr. Jan. 1857. No. **6318**. In sandy places at the river Cuanza, near Quisonde, collected in flight ; fl. and fr. March 1857. No. **6319**.

Huilla.—In places neglected after cultivation, about Lopollo, plentiful, in company with *Monsonia biflora* DC. (Welw. herb. no. 1606; *ante*, p. 108); fl. and fr. Jan. and Feb. 1860. No. **6317**.

2. **BETA** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 52.

1. **B. vulgaris** L. Sp. Pl., edit. 1, p. 222 (1753).

B. maritima L. Sp. Pl., edit. 2, p. 322 (1762). *B. procumbens* Sm. in Hornem. Hort. Hafn. Suppl. p. 31 (1819); J. A. Schmidt, Beitr. Fl. Cap Verd. p. 171 (1852).

Cape de Verde Islands.—In sandy places in the island of St. Vincent; fr. Jan. 1861. No. **6325**.

3. **ATRIPLEX** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 53.

1. **A. paludosa** R. Br. Prodr. p. 406 (1810).

Mossamedes.—A much branched undershrub or almost a shrub, 5 to 8 ft. high; branches patent, elongated, subscandent; leaves somewhat fleshy, whitish-lepidote. In bushy brackish places about Caroca, about 13 miles distant from the ocean, plentiful, somewhat climbing among *Tamarix orientalis* Forsk. (Welw. herb. no. 1086; *ante*, p. 55) and *Gymnosporia* (cf. *G. senegalensis* Loesen.; Welw. herb. nos. 1267 and 1362; *ante*, p. 145); fl. and fr. Sept. 1859. No. **6327**.

Our plant is dicœcious, and agrees fairly well with the type specimens of Brown's species in the National Herbarium.

4. **ARTHROCNEMUM** Moq.; Benth. & Hook. f. Gen. Pl. iii. p. 65.

1. **A. macrostachyum** Moris & Delporte in Ann. Sc. Nat. Ser. 4, ii. p. 377 (1854).

Salicornia glauca Delile, Fl. Egypt Illustr. p. 49 (1812). *S. macrostachya* Moric. Fl. Vinet. p. 2 (1820); Guss. Fl. Sic. p. 13. t. 4 (1829). *A. fruticosum*, γ. *macrostachyum*, & *glaucum*, Moq. Chenopod. Mon. Enum. p. 112 (1840). *A. glaucum* Ung.-Sternb. in Atti Congr. Bot. Firenze, p. 283 (1876).

Ambriz.—At the river Onço (? 16 Nov. 1853), without fl. or fr. Doubtfully referred to this species. No. **6330**.

Loanda, etc.—A decumbent undershrub, remarkably gregarious, partly constituting broad round tracts of the shore 6 to 20 fathoms in diameter, intermixed with *Halimum* (cf. Welw. herb. an. 2382-2390); stems prostrate, woody, scarcely jointed but nodulose; branches and branchlets opposite, erect; joints cylindrical, mostly $\frac{1}{3}$ in. long, glaucous, blood-red at the base and apex, blunt, emarginate; spikes central on the branchlets, an inch long, torulose, scarcely thicker than $\frac{1}{12}$ in., with joints $\frac{1}{12}$ in. long, in old age dryly spongy; seeds ellipsoidal, irregularly trigonous, scarcely $\frac{1}{24}$ in. long, shortly beaked, chestnut-brown, smooth. The seeds agree with this genus in respect of the embryo. In sandy maritime places at the mouth of the river Sança (Mossul), and at Praia da Zamba grande to the south-west of Loanda, plentiful; fl. and fr. end of Nov. 1853. No. **6331**.

This is probably the plant referred to as *A. indicum* by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 253. n. 24; he states that it abounds in soda.

Mossamedes.—A perennial, fleshy, green-purplish, densely cæspitose herb, the clumps hemispherical and 2 to 3 ft. in diameter. In gravelly places near Boca de Giraul, very plentiful, in company with *Cressa cretica* L. (*ante*, p. 724); fl. July 1859. No. **6328**.

The following No., which in the dry state is grey-green with its branches narrowly winged, and on which I do not find any flowers in the British Museum specimen, is probably a species of this genus, possibly an annual form of *A. indicum* Moq., or a *Salicornia*.

Mossamedes.—An annual, prostrate, ascending, subglaucescent watery-fleshy herb, turning red in old age. In salt places near Caroca, Cabo Negro, in company with *Tamarix orientalis* Forsk., *Heliotropium supinum* L., and *Heleochloa schœnoides* Host.; Sept. 1852. No. **6329**.

5. **LERCHIA** Hall. in Comment. Gotting. i. p. 224 (1752), & Enum. Pl. Gotting., edit. 2, p. 21 (1753), & ex Zinn, Cat. Pl. Gotting. p. 30 (1757); non Reichenb. (1828).

Dondia Adans. Fam. Pl. ii. pp. 261, 550 (1763); non Spreng. (1813). *Lerchea* Rüling, Ord. Nat. Pl. p. 47 (1774); non L. (1771). *Suæda* Forsk. Fl. Ægypt. Arab. p. 69. t. 18, B. (1775); Benth. & Hook. f. Gen. Pl. iii. p. 66.

1. **L. obtusifolia** Steud. Nomencl. Bot. edit. 1, pp. 187, 474 (1821) (*Lerchea*).

Chenopodium fruticosum L. Sp. Pl., edit. 1, p. 221 (1753). *Salsola fruticosa* L., *l.c.*, edit. 2, p. 324 (1762). *Suæda fruticosa* Forsk., *l.c.*, pp. cix. 70. *L. maritima*, γ. *fruticosa* O. Kuntze, Rev. Gen. Pl. ii. p. 549 (1891) (*Lerchea*). *Lerchea fruticosa* B.D. Jacks. Ind. Kew. ii. p. 66 (1894). *Dondia fruticosa* Druce in Ann. Scott. Nat. Hist. 1896, p. 42.

Benguella.—A much-branched shrub, as tall as a man, with numerous stems. In gravelly seaside places near the city of Benguella, plentiful; June 1859, not then in good fl. No. **6322**.

Mossamedes.—A shrub, 4 to 6 ft, high; stems numerous, branched from the base; branches and branchlets numerous, mostly purplish; leaves succulent, glaucescent. In gravelly thickets, close to the banks of the river Bero, very plentiful; inside the mouth of the river; fl. July 1859. No. **6321**. On the Cazados sands, near Mossamedes, common. A young branch, without fl. or fr., apparently belonging to this species; beginning of August 1859. No. **6321***b*.

6. **SALSOLA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 71.

1. **S. aphylla** L. f. Suppl. Pl. p. 173 (1781).

Mossamedes.—A glaucous-hoary shrublet, with the habit of *Lerchia*, and with numerous branches from the base; stems and branches prostrate; flowers reddish. At the sides of sandhills near Cavalheiros, plentiful; fl. July 1859. No. **6320**.

CIII. PHYTOLACCACEÆ.

1. **HILLERIA** Vell. Fl. Flum. p. 47 (1825), i. tab. 122 (1827).

Mohlana Mart. Nov. Gen. & Sp. iii. p. 170. t. 290 (1829); Benth. & Hook. f. Gen. Pl. iii. p. 81.

1. **H. elastica** Vell., *l.c.*

Rivina latifolia Lam. Tabl. Encycl. i. p. 324 (1792); Poir. in

Lam. Encycl. Méth. vi. p. 215 (1804). *R. secunda* Ruiz & Pav. Fl. Per. i. p. 65. t. 102, fig. *a* (1798). *R. lanceolata* Willd. Enum. Hort. Berol. Suppl. p. 8 (1813). *R. acuminata* H. B. & K. Nov. Gen. ii. p. 184 (1817). *R. affinis* Nees & Mart. in Nov. Act. Nat. Cur. xi. p. 30 (1823). *R. apetala* Schum. & Thonn. in Danske Vid. Selsk. iii. p. 104 (1828). *Mohlana nemoralis* Mart., *l.c.*, p. 171. *M. secunda* Mart., *l.c.*, p. 172. *R. inæqualis* Hook. Ic. Pl. ii. t. 130 (1837). *M. guineensis* Moq. in DC. Prodr. xiii. 2, p. 15 (1849); Welw. Apontam. p. 558, sub n. 134 (1859). *M. latifolia* Moq., *l.c.*, p. 16. *Hillera secunda* O. Kuntze, Rev. Gen. Pl. ii. p. 551 (1891).

Golungo Alto.—An undershrub, 1 to 3 ft. high, woody at the base; leaves dull green above, pallid beneath, repand-crenate; the young stem somewhat angular, becoming when older almost cylindrical and woody; petioles decurrent on the young stem in two hairy lines; calyx 4-cleft, petaloid and whitish rosy when young and during the flowering, turning green and somewhat fleshy as the fruit ripens, bilabiate, three of the segments representing the lower lip and the fourth one the upper. In the primitive forest close to the banks of the river Cuango, in Sobato de Mussengue, about Sange, plentiful; fl. and young fr., Dec. 1854. No. **2440**. In very shady places at the cataracts of the river Cuango and by streams in Mata de Quibanga, plentiful; fl. and fr. Dec. 1855. No. **2440***b*.

2. **PHYTOLACCA** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 84.

1. **P. dodecandra** L'Herit. Stirp. Nov. p. 143. t. 69 (1789).

P. abyssinica Hoffm. in Comm. Gotting. xii. p. 25. t. 2 (1796). *Pircunia abyssinica* Moq. in DC. Prodr. xiii. 2, p. 30 (1849); A. Rich. Fl. Abyss. ii. p. 222 (1851). *Pirc. saponacea* Welw. Apontam. p. 558, sub n. 134 (1859); Cat. Sect. Portug. Expos. Univers. Paris, p. 451. n. 12 (1867).

Golungo Alto.—An undershrub, climbing high, with white-yellowish flowers and scarlet fruits. In tall thickets near Trombeta, fl. Sept. 1854, the var. *latifolia* A. Rich., *l.c.*; in thin forests among the Serra do Alto Queta mountains; fl. and fr. March 1855. No. **2438**. A shrub, climbing far and wide; branches long-sarmentose; leaves subglaucous, somewhat fleshy; flowers pale sulphur in colour, arranged in long spikelike racemes; berries scarlet; fl. and fr. May 1855. Coll. Carp. 861.

Pungo Andongo.—A shrub, but little woody, climbing to the height of 10 to 30 ft., not twining; leaves herbaceous, glaucous-green; flowers white; fruits scarlet. In rocky wooded places between Caghuy and Mutollo, sporadic; fl. and fr. Nov. 1856. No. **2439**.

The negroes call this plant "Mutonga-Tonga," and they use the leaves, when boiled or pounded, instead of soap for washing clothes, but it is inferior to "Jindondólo," *Solanum albifolium* Wright, *ante*, p. 747. See Welwitsch, *l.c.* In the Paris catalogue, *l.c.*, the plant is placed among the medicinal specimens from Cazengo; in the same catalogue, p. 456, n. 63, "Mutonga-tonga," bark and leaves from the district of Duque de Bragança, is said to be employed in dropsies and in cases of retention of urine, and to be a drastic purgative; Welwitsch also noted that it is drastic in small quantities.

2. **P. dioica** L. Sp. Pl., edit. 2, p. 632 (1762); Welw., *l.c.*
Pircunia dioica Moq., *l.c.*, p. 30.

A valuable tree, especially useful for the sake of the dense shade which it affords; the Portuguese call it "Bella sombra"; Welwitsch, *l.c.*, recommended its introduction into Angola, as being a quick grower and well adapted for planting in the public squares, etc. Cultivated about Lisbon; fr. 1861. Coll. Carp. 863.

CIV. POLYGONACEÆ.

1. **OXYGONUM** Burch.; Benth. & Hook. f. Gen. Pl. iii. p. 96.
Raphanopsis Welw. Apontam. p. 547, sub n. 75 (1859). *Diplopyramis* Welw., *l.c.*, p. 591. n. 106.

1. **O. alatum** Burch. Trav. i. p. 548. n. 2074 (1822); Benth. in Hook. Ic. Pl. xiv. p. 14. t. 1321 (1880).

Huilla.—An annual herb, with the habit of a *Raphanus*, agreeably acidulous in all parts, tasting like *Rumex Acetosella* L., edible, divaricately branched from the base, the lower part subscabrid or subpubescent with whitish setulæ or papillæ directed downwards; root and base of the stem bloodred-purple; leaves glaucescent, somewhat fleshy, lanceolate, more or less deeply incised or even laciniate; flowers hemaphrodite and male, racemose along an elongated rachis, two together in the axil of each bract; perianth milk-white, 5-cleft, the two outer segments keeled and mucronate with protracted-hooded keel, the other segments somewhat concave and without a mucro; stamens 8 or very rarely 5; filaments dilated and bearded at the base; anthers oblong, bluish; pollen whitish; ovary triquetrous, 1-celled; style trifid; stigmas capitate, yellow; achene triquetrous, enclosed in the fleshy acutely alate-trigonous tube of the perigonium and surmounted with its marcescent limb. On hot and somewhat rocky sands, in places neglected after cultivation, and by roadsides, near Lopollo; fl. Dec. 1859 and Jan. 1860, fl. and young fr. April and 1 May 1860. No. **1755**.

This differs from the type of the species, which was collected near the Asbestos mountains, in having its flowers milk-white instead of flesh-coloured.

2. **O. cordofanum** Dammer in Engl. Nat. Pflanzenfam. iii., 1*a*, p. 30 (1893).

Ceratogonon atriplicifolium Hochst. in Kotschy Pl. Nub. Exsicc. n. 117 (*U.i.*, 1841). *Raphanopsis* sp., Welw., *l.c.*, p. 547. *Diplopyramis æthiopica* Welw., *l.c.*, p. 591. n. 106. *Ceratogonum Cordofanum* Meisn. in DC. Prodr. xiv. p. 39 (1856). *C. sinuatum* Britten, Journ. Bot. xxxiii. p. 75 (1895), *partly*.

Ambaca.—An annual, much branched, fully developed herb; stem decumbent; branches ascending; flowers white. In neglected fields and barren plains near N-gombe, plentiful; fl. and fr. Oct. 1856. No. **1756***b*.

Pungo Andongo.—Flowering racemes seeming terminal when young but really axillary or rather alar, not nodding but the pedicels of the male flowers arching-recurved from the apex after flowering and the fertile flowers even in the fruiting state seated on erect pedicels; perianth white; anthers deep clear blue; fruit resembling

a double tetragonal pyramid, each pyramid being placed base to base with reference to the other. In the poorer plots of cultivation and on rubbish heaps, very plentiful, extending from Ambaca to the præsidium; fl. and fr. Nov. and Dec. 1856. No. **1756**. An annual, procumbent-ascending herb, with white flowers and blue anthers. In cultivated places and by roadsides; fr. Feb. 1857. Coll. Carp. 864.

3. **O. sinuatum** Dammer, *l.c.*

Ceratogonon sinuatum Hochst. & Steud. in Schimp. Pl. Abyss. Exsicc. i. n. 264 (*U.i.*, 1840); Britten, *l.c.*, partly.

Huilla.—An annual, glaucescent herb, with white flowers. In pastures among low bushes, flooded in the rainy season, near Lopollo, rather rare; fl. and young fr. Jan. 1860. No. **1758**.

Perhaps only a form of the previous species.

4. **O. Acetosella** Welw. in Trans. Linn. Soc. xxvii. p. 60 (1869); Ficalho, Pl. Uteis, p. 244 (1884).

Mossamedes.—An annual, glabrous, somewhat fleshy, quite glaucous, decumbent or prostrate herb, branched from the base; stem semi-cylindrical, the rachis of the flowering racemes acutely triquetrous; ochreæ truncate, quite entire or minutely erose-denticulate; leaves broadly lanceolate or ovate-lanceolate, gradually narrowed into the winged petiole, repand-toothed or sinuate-dentate on the margin, rather fleshy, very agreeably acidulous, when cooked rivalling those of *Rumex Acetosella* L. and providing a complete substitute for them; perianth deeply 5-cleft, corolline-whitish; the segments obovate or broadly elliptical, obtuse, apiculate, somewhat concave, patent, the two outer ones with a green keel, stamens 8; filaments subulate; anthers didymous, versatile, pale blue; style deeply trifid, white; stigmas capitate, yellow; achene included in the tube of the perianth and adhering to it, elongate-ovate, obsoletely and bluntly trigonous when not quite ripe; bracts 3- to 5-flowered; racemes often 1½ ft. long. In sandy maritime hilly places from Mossamedes towards Cabo Negro, especially near Praia da Amelia, plentiful; fl. and young fr. June and July 1859. Called "Azedas bravas" (wild sorrel). No. **1757**.

2. **POLYGONUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 97.

1. **P. herniarioides** Delile, Fl. Ægypt. Illustr. p. 61 (1812).

Mossamedes.—An annual, prostrate herb, with the habit of *P. aviculare* L., and whitish-rosy flowers. In moist sandy places at the river Bero; fl. July 1859. No. **5372**.

Huilla.—In poor pastures flooded in summer, near Ohai; fl. and fr. April 1860. No. **5373**.

2. **P. scabrum** Poir. in Lam. Encycl. Méth. vi. p. 148 (1804).

P. salicifolium Broussonet ex Willd. Enum. Hort. Berol. p. 428 (1809). *P. serrulatum* Lagasca, Gen. et Sp. Pl. p. 14. n. 181 (1816). *Persicaria serrulata* Webb & Moq. in Webb & Berth. Phyt. Canar. iii. p. 219 (1842-43 ?); J. A. Schmidt, Beitr. Fl. Cap Verd. Ins. p. 177 (1852).

Golungo Alto.—At the banks of the river Muria near Ponte de Muria; fl. and fr. Sept. and Oct. 1854. No. **5367**.

Mossamedes.—A perennial herb, 3 to 5 ft. high; stem rooting, ascending, quasi-scandent among Scirpoideæ (cf. *Scirpus maritimus*

L. ; Welw. herb. no. 6974) and reeds, purplish, sparingly branched ; flowers whitish-rosy. In swampy places at the mouth of the river Giraûl, plentiful ; fl. 19 July 1859. No. **5369**.

Huilla.—At Lopollo ; fl. Dec 1859 ; also in wet wooded places by the Monino ; fl. Jan. 1860. No. **5368**. A glaucescent herb. In marshy places at the river Panda ; fl. and fr. Feb. 1860. No. **5371**. Floating in the river Caculuvar, near lake Ivantâla, in company with a Commelinacea (cf. *Floscopa glomerata* Hassk. ; Welw. herb. no. 6590) ; fl. end of Feb. 1860. No. **5370**.

Cape de Verde Islands.—By waterfalls behind Villa de Praia, in the island of San Thiago, in company with *Lemna minor* L. ; fl. and fr. Jan. 1861. No. **5366**.

I have not seen the type of Poiret's species, which was found in Barbary ; but it apparently belongs to the same species as our specimens.

3. **P. lanigerum** R. Br. Prodr. p. 419 (1810).

Var. γ. **africanum** Meisn. in DC. Prodr. xiv. p. 117 (1856).

Barro do Bengo.—At the margins of the river Bengo, near Quifandongo, plentiful ; fl. and fr. 12 Sept. 1854. No. **5365**.

Pungo Andongo.—An ascending or erect herb, 2 to 4 ft. high ; stem fistulose, rather thick ; flowers whitish-rosy. In marshy places at the banks of the river Luxillo, near the bridge, towards Cambambe, rather sparingly ; fl. and fr. April 1857. No. **5364**.

Huilla.—A sparingly branched, erect herb, 4 to 6 ft. high. By streams among tall grasses, near Lopollo ; fl. and fr. May 1860. No. **5363**. An erect, nodose, apparently annual herb, 3 to 5 ft. high ; leaves ovate-lanceolate, acuminate, white-woolly above, snow-white-tomentose beneath ; spikes paniculate, rather thick, rosy. By river banks near Lopollo, at Ivantâla ; fl. and fr. Feb. and April 1860. Coll. Carp. 866.

This plant, in conjunction with *P. tomentosum* Willd., *Mirabilis Jalapa* L., and *Canna orientalis* Rosc., forms the mass of the herbaceous vegetation along streams in Pungo Andongo.

4. **P. limbatum** Meisn., *l.c.*, p. 123.

Huilla.—In marshy wooded places from Ferrão da Sola towards Jaû, and seen nowhere else ; fl. Feb. 1860. No. **5374**.

5. **P. senegalense** Meisn. Mon. Polyg. p. 54 (1826) ; Welw. in Ann. Cons. Ultramar. Lisb. No. 7 (August 1854), p. 80. n. 21.

Barra do Bengo.—A handsome plant ; stem as thick as a man's finger, some thicker, fistulose, brilliantly red, 4 to 10 ft. high, decumbent or even floating. At the margins of the river Bengo, between Quifandongo and Prata, at the convent of Santo Antonio ; fl. Dec. 1853. No. **5359**, *partly*.

Icolo e Bengo.—A herb, 4 to 6 ft. high ; stem sometimes decumbent sometimes ascending, remarkably and widely fistulose, a finger thick, reddish purple ; flowers whitish rosy. At the banks of the river Bengo (Zenza), from Santo Antonio to Tamdambondo, sparingly ; fl. and fr. beginning of Sept. 1857. No. **5359**, *partly*. Stems tortuous, thick, fistulose, 2 to 6 ft. high. At the river Bengo ; fl. and fr. Dec. 1857. Coll. Carp. 865.

Mossamedes.—An apparently perennial herb ; stem thick, fistulose, 3 to 7 ft. high, an inch thick, decumbent or nodding ; branches erect ; flowers whitish rosy. In ponds or gently flowing pools at the banks of the river Bero ; fl. and fr. July 1859. No. **5358**.

This plant was met with also in abundance by rather deep ponds at Represa do Manuel Pereira van Hunnen in the district of Loanda; it flowers from December to March, and is perennial; its hollow stem is constricted at the nodes and remarkably moniliform, that is, the joints are strongly inflated; the stem is sometimes erect and 4 to 5 ft. high, and sometimes decumbent and 6 to 12 ft. long by an inch in diameter; it is throughout of a pretty reddish colour.

6. **P. tomentosum** Willd. Sp. Pl. ii. p. 447 (1799).

Cf. Houttuyn, Handleid. viii. p. 467. t. 49. f. 1 (1777), under *P. ocreatum*.

Ambaca.—An erect or ascending, cinereous herb, 2 to 3 ft. high, with pallid rosy flowers. By streams, between Puri-Cacarambola and N-gombe, in company with *Rorippa Nasturtium* Beck; Oct. 1856, but not then in good fl. No. **5361**.

Pungo Andongo.—A marsh herb; stems often elongated, a foot long or more, simple, decumbent-ascending or almost floating, bearded at the nodes with long root-like fibres; flowers whitish-rosy. By pools close to the banks of the river Luxillo, near the bridge, not common; fl. Jan. 1857. A specimen, poorly represented in the British Museum set, apparently of this species. No. **5360**.

See note under *P. lanigerum* R. Br.

Var. **limnogenes**.

P. limnogenes Vatke ex Engl. Hochgebirgsflora, p. 202 (1892).

Leaves scabrid.

Huilla.—An erect herb, 2½ to 4 ft. high; ochreæ ferruginous; spikes somewhat nodding; flowers from whitish to slightly rosy. At river banks near Humpata, in company with willows; fl. and fr. April 1860. No. **5362**.

This is probably the *Polygonum* with which grew the grass *Panicum Crus-pavonis* Nees, Welw. herb. no. 7490; *post*, ii. p. 173.

3. **RUMEX** L.; Benth. & Hook. f. Gen. Pl. iii. p. 100.

1. **R. abyssinica** Jacq. Hort. Vindob. iii. p. 48. t. 93 (1776) (*abyssinicus*).

Pungo Andongo.—An erect, apparently perennial herb, 2 to 5 ft. high; leaves deltoid or lance-shaped, herbaceous-green above, glaucescent beneath, the radical ones with long petioles. In rich bushy pastures in deep valleys among the gigantic volcanic rocks of Pungo Andongo; fl. and young fr. Dec. 1856 and Jan. 1857; also in rather elevated rocky places by the streams of Catete and Cabondo in the præsidium; fl. and young fr. Feb. and April 1857. No. **5356**.

Huilla.—A branched herb, 2 to 4 ft. high. By streams; fl. and fr. Dec. 1859. No. **5357**. By rivulets near Lopollo; fr. Jan. 1860. Coll. Carp. 878.

This is the *Rumex* mentioned by Welw. in Journ. Linn. Soc. v. p. 187 (1861).

4. **BRUNNICHIA** Banks; Benth. & Hook. f. Gen. Pl. iii. p. 103; Dammer in Engl., Bot. Jahrb. xxvi. p. 347 (31 Jan. 1899).

1. **B. africana** Welw. in Trans. Linn. Soc. xxvii. p. 61 (1869); Oliv. in Hook. Ic. Pl. xiv. p. 21, t. 1328 (Feb. 1881); Dammer, *l.c.*, p. 357.

Golungo Alto.—A slender, much-branched shrub, climbing high

and wide, not milky ; branches elongate-virgate, horizontally patent or even bent downwards and nodding, angular, cirrhose ; tendrils bifid at the apex ; leaves papery, bright green and glossy above, paler beneath, oblong or elliptical-ovate, abruptly narrowed at both ends or wedged-shaped at the base ; petiole amplexicaul, forming a short ochrea ; flower-racemes not cirrhose at the apex but the peduncles or the branchlets from the axils of the leaves below the inflorescence transformed into tendrils of 2 to 4 in. long ; perianth obversely fusiform, jointed to the much compressed pedicel, compressed-winged, connate with the base of the ovary, the limb 5-partite, the segments convolute-semi-imbricate in æstivation, patent during the flowering, herbaceous-green outside, rosy-red inside ; stamens 10 or very rarely only 5, inserted on the throat of the perianth, 5 of them, those opposite the perianth-segments, a little longer than the others, flattened from the base, filiform, exserted ; anthers rotundate-cordate, very deep vermilion-red, introrse, 2-celled, the cells cohering only at the point of insertion of the filaments, dehiscing longitudinally ; ovary nearly free, fusiform, trigonous, terminating gradually in the style ; stigmas 3, delicately capitate ; ovary 1-celled, 1-ovuled ; the ovule erect, seated at the base on the thick column or funicle ; fruit with the winged pedicel vividly blood-red, 5 to 7 times as long as the perianth. In rather dense primitive forests by streams among the mountains in Sobato de Bumba and at the Capopa cataract near Sange, sporadic ; fl. and fr., 28 Sept. 1855 ; in company with *Bombax buonopozensis* P. Beauv. (Welw. herb. no. 5413), *Leea guineensis* G. Don (Welw. herb. no. 1487, and *Trymatococcus kamerunensis* Engl., var. *Welwitschii* Engl. (Welw. herb. no. 2594). No. **1754**. At Capopa ; fr. April 1856. Coll. Carp. 982.

CV. PODOSTEMACEÆ.

The plants of this order have a remarkably peculiar habit resembling in this respect some Algæ and Jungermanniæ ; they are poorly represented in Angola, Welwitsch having collected only two out of the 170 species or thereabouts in all ; these two species, moreover, were found each in a single station, namely in the cool and clear streams confined within rocks among the mountains of Pungo Andongo, though they were searched for in vain in similar situations up to 16° S. Lat. and 5600 feet of altitude. One of the species strikingly resembles a *Hypnea* (*Florideæ*), and it grows with a shield-like knotty base attached in an exactly similar fashion to stones at the bottom of the streams. The second species, which at first sight might be mistaken for a *Jungermannia*, occurs also at the bottom of streams, but it grows in dense extensive tufts after the manner of various *Jungermanniæ*. Each of the species seems rarely to bear fruit and then only when the streams in which they grow decrease so much in depth by evaporation in the hot season that the plants have their upper branches exposed to the atmosphere. The texture also of these species resembles that of some Algæ ; they have the same elastic stiffness when taken fresh out of the water, the same rapid crumbling, the same knot-like appearance of the stem (though on closer examination really different), and the same kind of cartilaginous disk at the point of attachment.

1. **TRISTICHA** P. Thouars in Roemer, Collect. Bot. p. 197. n. 8 (1809); Benth. & Hook. f. Gen. Pl. iii. p. 108.

1. **T. hypnoides** Spreng. Syst. Veg. iv. Cur. Post. p. 10 (1827).
Var. **fontinaloides** Wedd. in DC. Prodr. xvii. p. 45 (1873).
T. fontinaloides Welw. ex Wedd., *l.c.*

Pungo Andongo.—An aquatic herb, 3 to 10 in. long, branched in a dichotomous or fasciculate manner like *Fontinalis antipyretica*, attached after the fashion of the Florideæ, with a shield-like cartilaginous sordid-rosy or purplish callus, to the submerged rocks in clear streams, when removed from the water rapidly becoming very limp; stems several from the same root, cæspitosely clustered, the young ones erect, subcompressed, greenish purple, the older and fruiting ones floating, flatly compressed, reddish purple, subcartilaginous and as the branches and branchlets (which are at length subcylindrical) semipellucid and flexible, in youth more densely and in adult age more loosely leafy; leaves alternate, apparently distichous but really trifarious, those of two rows distichously patent, those of the third row shorter, erect, adpressed to the stem, almost imitating the amphigastria of Jungermanniæ, all very brightly deep-green, oblong-lanceolate, obtuse, 1-nerved, quite entire, narrowed and sub-decurrent at the base; flowers axillary, solitary, at first subsessile and involucrate with bracteoles, soon with firm rather thick straight and long peduncles; bracteoles at length oblong, rather broad, membranous, 2 or 3, usually 2, at the base of the peduncle at length free, spreading, persistent in fruit; perianth-segments 3, thinly chartaceous, green, at first subconnate beyond the middle, at length as the ovary enlarges free to the base, equal, ovate-oblong, concave, adhering to the mature ovary, persistent, then spreading, but little or scarcely exceeding the capsule; stamen 1, hypogynous; filament compressed-filiform, at the beginning of the flowering included, soon rather far exserted; anther 1, terminal, red, attached at the emarginate base, ovoid-oblong, 2-celled, dehiscing longitudinally; ovary ovoid, incompletely (?) 3-celled, the cells with several ovules; stigmas 3, purple, filiform, erect during the flowering, at length diverging; capsule brick-red-brown, oblong-ovoid, crowned at the top with the indurated styles, longitudinally sulcate-costate, 3-valved; the valves tricostate, boat-shaped, when dehisced laying bare a placentiferous column which bears the erect seeds in its depressions; seeds very numerous, elongate-ellipsoidal, compressedly biconvex; testa thin, pellucid, somewhat viscid; the inner lining bright brown, very delicately and roundly foveolate. On submerged stones in the clear mountain streams of Pedra de Cabondo, in the præsidium; sparingly fruiting, Feb. 1857. No. **527**.

The Alga n. 109, and perhaps also n. 108, grew on the branchlets.

2. **T. trifaria** Tulasne in Ann. Sc. Nat., ser. 3, xi. p. 111 (1849).
Dufourea trifaria Bory ex Willd. Sp. Pl. v. p. 55 (1810).

Pungo Andongo.—A herb with the habit of a *Jungermannia*, growing on submerged rocks in cold streams, at first erect, afterwards as the stem branches more or less elongated, somewhat floating, at length as the water in the streams dries up decumbent on the rocky or muddy-sandy bottom and in this state mostly fruiting, just as in mosses the luxuriant specimens rather rarely flowering or fruiting, firmer and more rigid than the last species; root scutiform, cartilaginous, reddish, closely adhering to the matrix; stems compressed-flat, occasionally even much dilated, cæspitose, in the living state tinged

with red or purple, in the dry state dull reddish ; leaves broader and more densely trifariously imbricate than those of the last species, dull or almost obscurely green without gloss, those of the third row erect, adpressed to the stem more or less orbicular and half the length of those in the distichously spreading other rows ; capsules almost equal in size to those of the last species ; the whole plant turning black in drying. Attached to submerged rocks in the stream Casalalé in the præsidium, rather rarely flowering ; fl. and fr. Feb. 1857. No. **528**. By the rivers Casalalé and Cambondo ; fl. and fr. Jan. 1857. Coll. Carp. 942. It flowers from January to March. Several species of Algæ grew on the branches. Cf. Algæ nn. 105, 108, 109.

CVI. CYTINACEÆ.

1. **PILOSTYLES** Guillemin in Ann. Sc. Nat., ser. 2, ii. p. 19. t. 1 (1834).

Frostia Bertero ex Guillemin, *l.c.* *Apodanthes* Benth. & Hook. f. Gen. Pl. iii. p. 118 ; non Poit. (1824).

1. **P. æthiopica** Welw. in Trans. Linn. Soc. xxvii. p. 67. t. 22 (1869) ; Hook. f. in DC. Prodr. xvii. p. 114 (1873).

A small parasite, growing in masses, after the fashion of the tubercle-shaped Sphæriæ, on the thinner branchlets of trees on all sides, but chiefly on the side exposed to the light, springing from their bark sometimes in definite rows and in other cases irregularly. Slender threads or very delicate membranes pervade the liber and take the place of the root like a mycelium. The parasites first appear as small hemispherical nodules, which are afterwards broken by the protrusion of a rather hard globular or somewhat conical light brown body appearing under the microscope to be covered with small tender more or less circular scales which give the globular body an areolate surface and make it quite analogous to the uterus of some Fungi, as for instance *Clathrus*, and almost of a woody consistency ; it soon bursts either irregularly or in a circumsciss manner, the upper arched part falling off like a hood, and the lower part remaining firm on the bark like an elevated bowl-shaped ring, which permanently encircles the buds as they sprout and the fruit when subsequently formed. The whole of the process, from the first manifestation of the little nodules up to the inflorescence and fructification, appears to be completed in a very few days : thus Welwitsch found on the 10th May 1860 male flowers which were then nearly all in bud with only a few having their perianth expanded, and two days later he found the same flowers nearly all quite withered and past. On a close examination of these fungus-like plants Welwitsch was involuntarily reminded of the flowers of certain Asclepiadeæ especially of some *Stapeliæ* ; and the foul smell of the latter is said to occur in some species of Rafflesieæ. The flowers are diœcious, involucrate ; involucre globose, crustaceous, pale brown, branny-areolate, smooth inside, enclosing one or rarely two (in one instance three) flowers, circumsciss or bursting irregularly, the patelliform base

persistent; flower subsessile at the bottom and centre of the involucre, bright rosy-bloodred throughout, $\frac{1}{8}$ to $\frac{1}{5}$ in. high. bud-shaped, bracteate; bracts several, 8 to 10, scale-like, broadly ovate, concave, obtuse, bright bloodred, arranged in an ascending spiral, covering the perianth of the flowers, whether of the male flowers at the time of the flowering or of the female flowers both during the flowering and during the swelling of the ovary. Perianth of the male flowers 4- to 7- or even 8-phyllous; the segments obtuse, spongy-callous at the base inside, imbricate in the bud, erect-spreading during the flowering, incurved at the apex; corona of the throat 4- to 8-angled, the angles prominent and alternating with the segments of the perianth; staminal column subconical-cylindrical, truncate at the apex, sheathing the column of the free style; anthers contiguous, sessile, below the apex of the staminal column; pollen copious, whitish; style-column cylindrical; stigma hemispherical-peltate, exserted, closing the cavity of the staminal column; ovary obsolete; all parts of the flower at first rosy purple, soon bloodred and marcescent, afterwards reddish yellow, always more or less fleshy, and the flower when rubbed abounding in a red carmine juice which imparts to paper a tolerably fast colour. In the female flowers the buds (and also the expanded flowers) are a little longer and narrower than in the male flowers, ovoid-conical and not globose as in the male; perianth almost completely covered by the scale-like somewhat fleshy bracts, adhering to the ovary, 6-phyllous; the segments scarcely ever well expanded, resembling the bracts in colour, consistency and shape, quite glabrous, spongy-callous at the base inside; corona of the throat not flat but prismatic, analogous to the septiform membranes in *Cytinus*, 6-angled, the angles prominent and alternating with the segments of the perianth; ovary half inferior, globose-ellipsoidal, unilocular; placentation parietal; ovules numerous; style from the centre of the corona erect, broadly conical, viscid-fleshy; stigma hemispherical-capitate, rarely 2- very rarely 3-umbonate, tubercular, very delicately wrinkled; seeds very many, bright flesh-coloured, wrapped in a viscid material, scarcely arranged in regular order, soft, slightly crustaceous.

Huilla.—Parasitical on branchlets of the Panda tree, *Berlinia paniculata* Benth. (Welw. herb. no. 577), the male plant seen only on this tree; in the elevated (5500 ft.) forests of Morro de Monino, sparingly; male fl. 10 May 1860. No. **529***b*. On branchlets of the Panda tree, *Brachystegia spicæformis* Benth. (Welw. herb. no. 583); in the same neighbourhood as the male plants but rarer; female fl. 12 May 1860. No. **529**.

The plant seems to be very rare, for during the seven months during which Welwitsch was almost always and even daily traversing the forests chiefly composed of Leguminous trees, he found it only on a few Leguminous trees, all of which belonged to those called Panda trees, once on a glabrous kind and a second time male plants on a tomentose variety of Panda.

A small bread-coloured *Curculio* attacks and quickly destroys the

flowers and fruits of the *Pilostyles*; and even two species of *Curculio* were met with in one and the same flower.

Welwitsch considered that the flowers of this plant are not theoretically without peduncles, any more than those of *Lemna* or *Pistia*, but that the stalks are extremely reduced, just as the axis of the inflorescence in Compositæ; this view is confirmed by the spiral arrangement of the bracts.

2. **HYDNORA** Thunb.; Benth. & Hook. f. Gen. Pl. iii. p. 120.

Aphyteia L. ex Achar. Dissert. Pl. Aphyt. p. 8 (22 June 1776).

1. **H. africana** Thunb. in Vet. Acad. Handl. Stockh. xxxvi. p. 69. t. 2 (1775). *Aphyteia Hydnora* Achar., *l.c.*, p. 10, c. tab.

Var. **longicollis** Welw. in Trans. Linn. Soc. xxvii. pp. 66, 94 (1869); Hook. f. in DC. Prodr. xvii. p. 109 (1873); Ficalho, Pl. Uteis, p. 244 (1884).

H. longicollis Welw., *l.c.*, t. 21; Solms in Engl. & Prantl, Nat. Pflanzenfam. iii. 1, p. 285 (1889).

Mossamedes.—A fleshy-coriaceous plant, like a fungus in shape, dusky-brickred throughout; smell stercoraceous; rhizome or underground stem thick, dull and purple-dusty outside, pale brickred inside, 5- to 7-gonal, horizontal or obliquely ascending, sparingly and remotely dichotomous, fleshy inside, beset along all the angles outside with blunt papilliform warts, perennial, parasitical on the roots of *Zygophyllum orbiculatum* Welw. (herb. no. 1637 and Coll. Carp. 27) and on a succulent *Euphorbia* (which it ultimately kills; cf. Welw. herb. no. 643), growing all the year round, producing in succession flowers from the angles of the rhizome, of which the first appear to be rudimentary and to constitute the rows of tubercles on the angles; perianth tubular, 3 to 8 in. high, an inch in diameter, obconic-cylindrical, bluntly rounded at the base, attenuate to the sessile base and there connate with the ovary, gradually widening upwards, deeply and transversely wrinkled, orange-red tending to brickred inside, dusky-cinnamon in colour outside, 3- or very rarely 4-cleft at the apex; the segments of the limb valvate in æstivation, ragged inside, connivent or even connate to the extreme tip; the sinuses rounded, not lobulate at the base; some or all of the segments very broadly furrowed within, bearing in the furrow a gland which covers all the upper part of the cavity of the furrow and is at first white and soon becomes dusky; the substance whitish-subferruginous, soon deliquescing and at the same time turning dusky and stinking after the manner of certain fungi; stamens isomerous with the perianth segments, 3 or 4, and opposite to them; filaments inserted on a ring at the middle of the tube and concrete with it; anthers cohering at the base, free at the apex, pyramidal-conical, blunt, many-celled, whitish-straw in colour; the cells parallel, unequal in length, transverse, variously curved or bent; ovary inferior, adnate to the tube below the anthers, 1-celled; placentas very numerous, densely ovuled, perpendicularly dependent in the cavity of the tube, bright white; ovules bright white; stigma subsessile, thick, broadly pulvinate, somewhat 3- or 4-lobed, sordidly purple-dusky, pale brick-red inside; the lobes shortly convex, delicately but clearly marked with transverse furrows. On maritime sandy hills near Mossamedes and as far as Cabo Negro, plentiful; fl. and fr. April, 23 June, and July 1859. No. **530**.

The plant in all parts and especially in the rhizome abounds in a

dusky cinnamon colouring matter which also contains tannin, and for this reason is frequently employed with complete success by the Mossamedes fishermen for staining their nets and preserving them for a long time from decay. Thunberg spoke of the plant as a fungus; and in his time it was known in South Africa by the name of "Jackhal's Kost." See Thunberg's *Travels*, Engl. ed., ii. p. 133 (1795). For a further account of this underground parasite see Monteiro, Angola, ii. p. 207 (1875).

CVII. ARISTOLOCHIACEÆ.

1. **ARISTOLOCHIA** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 123.

1. **A. albida** Duchartre in Ann. Sc. Nat., ser. 4, ii. p. 75 (1854), and in DC. Prodr. xv. 1, p. 483 (May 1864); Solereder in Engl. Bot. Jahrb. x. p. 437 (2 April 1889).

A. æthiopica Welw. Apontam. p. 548, sub n. 81 (1859).

Golungo Alto.—A climbing, perennial plant; stem mostly prostrate, with long sarmentose branches; calyx unilabiate, lurid, dusky purple; the lip obovate, oblong-panduriform, concave and hirsute above the middle, with reflected margins, glaucous and keeled below; epigynous disk with six crenations, each of which bears two extrorse bilocular longitudinally dehiscent anthers. In hilly places and on rather dry slopes at the outskirts of thickets and at the bushy banks of streams, occasionally plentiful; by the Ambaca road, fl. Aug. 1855, fr. Nov. 1855. No. **511**. A decumbent specimen; in hot rocky places near Sange, fl. beginning of Aug. 1855. No. **511***b*. In fr. Dec. 1854. Coll. Carp. 936.

Mossamedes.—A perennial, diffuse or widely climbing, much branched, suffrutescent herb; leaves coriaceous, somewhat limp; flowers blackish purple. In sandy maritime thickets between Mossamedes and Cavalheiros or Giraûl, very plentiful; fl. and fr. July 1859. No. **512**. In thickets near Mossamedes; in well developed fl. June 1859. No. **512***b*.

Welwitsch considered that the trivial name as a descriptive term was very unsuitable.

CVIII. PIPERACEÆ.

The aquatic plant, with edible tuberous rhizomes like chestnuts in taste, mentioned by Welwitsch in Apontam. p. 546, n. 63 and there placed under Saurureæ, is probably *Limnophyton obtusifolium* Miq.

1. **PIPER** L.; Benth. & Hook. f. Gen. Pl. iii. p. 129.

1. **P. umbellatum** L. Sp. Pl. edit. 1, p. 30 (1753); C. DC. Prodr. xvi. 1, p. 332 (1869).

P. subpeltatum Willd. Sp. Pl. i. p. 166 (1797); C. DC., *l.c.*, p. 333. *Heckeria subpeltata* Kunth in Linnæa xiii. p. 571 (1839); Engl. in Engl. & Prantl, Nat. Pflanzenfam. iii. 1, p. 6 (1889). *Pothomorphe subpeltata* Miq. Comm. Phyt. p. 37 (1840).

Golungo Alto.—A very elegant pepper, 3 to 5 ft. high; stem nodose; spikes whitish. In primitive very shady forests by the

streams Cuango and Delamboa, rather rare ; fl. and fr. end of April 1855. No. **501**. In fl. No. **6707**. A herb, 2 to 4 ft. high ; nodes reddish ; leaves very large, cordate, subpeltate ; spikes whitish, dichotomously cymose. By streams near Sange ; fr. April 1855. Coll. Carp. 939.

Pungo Andongo.—In the shady forests of Mata de Pungo in the præsidium, sparingly ; fl. and fr. March 1857. No. **502**.

Welwitsch saw the plant also about Muxaûlo.

2. **P. guineense** Thonn. in Danske Vid. Selsk. iii. p. 39 (1828) ; C. DC., *l.c.*, p. 343.

P. Clusii C. DC., *l.c.*, p. 340 ; Ficalho, Pl. Uteis, p. 245.

Golungo Alto.—A suffruticose herb, almost a shrub, climbing high, or a shrub with its trunk an inch thick at the base and climbing to a great height on trees attaching itself by means of root-like fibres which are produced on all sides ; stem nodose ; leaves subcoriaceous, glossy, faintly green ; drupes baccate, aromatic. In very dense elevated primitive forests in Sobato do Quilombo ; young plants, without fl. or fr. Feb. 1856 ; in the elevated forests of Quilombo-Quiacatubia, without fl. beginning of July 1855. No. **510**. A robust shrub ; trunk 2½ in. in diameter at the base ; with adventitious roots climbing high on *Monodora Myristica* Dun. (Welw. herb. no. 773, etc.) ; berries brick-red. In the forests of Sobato de Bumba, and more abundantly at Cucauéngui in Sobato de Quilombo-Quiacatubia ; fr. middle of July 1856. No. **508**. A peppery shrub, climbing to a great height. In the forests of Quilombo-Quiacatubia, 1856 ; specimens of the stem. Coll. Carp. 983. A tall climbing shrub ; berries brick-red ; seeds strongly aromatic-acrid ; fr. 1856. Coll. Carp. 940.

Island of St. Thomas.—Berries round, orange in colour, called "pimenta" (pepper). In dense forests at Fazenda de Monte Caffé ; fr. Dec. 1860. No. **509** and Coll. Carp. 941.

This plant is called "Jihéfo" or "Jihéfu," pronounced *Shihefu*, and furnishes true pepper a little smaller than the Indian pepper. The negroes call *Urera* sp. (Welw. herb. nos. 6268, 6279) wild or bastard Jihéfo.

2. **PEPEROMIA** Ruiz & Pavon ; Benth. & Hook. f. Gen. Pl. iii. p. 132.

1. **P. pellucida** H. B. & K. Nov. Gen. & Sp. i. p. 64 (1815) ; C. DC. in DC. Prodr. xvi. 1, p. 402 (1869).

Piper pellucidum L. Sp. Pl. edit. 1, p. 30 (1753).

Ambriz.—In the rocky forest between Ambriz and Quizembo, 100 to 150 ft. alt. ; Nov. 1857. Only one specimen saved during flight under pursuit by the Musulos. Apparently this species. No. **506**.

Cazengo.—A succulent, annual herb ; stems more or less decumbent or ascending, pale green, almost glassy-hyaline, angular, the angles decurrent from the sheaths of the leaves, narrowly winged ; leaves somewhat fleshy, green above, greenish white beneath, beset with very slender papillæ or hairs ; ripe seeds fairly minute, blackish, almost precisely spherical. In very shady primitive forests by streams in Serra de Muxaûlo ; rather rare ; fl. and fr. Jan. 1855. No. **504**.

2. **P. exigua** Miq. Syst. Piper. p. 77 (1843).

Piper exiguum Blume in Verh. Batav. Gen. xi. p. 232 (1826). *Micropiper exiguum* Miq. Comm. Phyt. p. 55, t. 9, f. d (1840).

P. freireæfolium Hochst. in Pl. Schimp. Abyss. iii. n. 1942 (*U. i.*, 1844). *Peperomia Vogelii* Miq. in Hook. Lond. Journ. Bot. iv. p. 413 (1845). *P. freireæfolia* A. Rich. Fl. Abyss. ii. p. 274 (1851). *P. exigua, β. freireifolia* C. DC., *l.c.*, p. 403.

Pungo Andongo.—A glassy-brittle herblet; stem pellucid, semi-cylindrical, marked with two wings due to the decurrent bases of the leaves; one stamen seen to be exserted; fruit globose-ovoid, borne on a bract. By damp rocks close to the stream Cásalalé to the south-west of the præsidium, in masses: fl. middle of Jan. 1857. No. **503**.

3. **P. Holstii** C. DC. in Engl. Bot. Jahrb. xix. p. 226 (1894).

P. Fernandopoiana var. *a.* C. DC. in Journ. Bot. iv. p. 134 (1866). *P. Fernandopoana*, var. *β. subopacifolia* C. DC. in DC. Prodr. xvi. 1, p. 397 (1869).

Pungo Andongo.—A succulent, brittle, dependent-ascending herb; stem cylindrical, a little constricted at the nodes, fleshy, pale green or purplish, decumbent, rooting here and there; leaves strongly shining, fleshy, blackish green and with impressed nervation above, whitish-pallid and with raised nerves beneath; flowering spikes greenish; berries ashy-violet or violet-blackish. On very shady rocks in Mata de Pungo in the præsidium; fl. and fr. March and middle of May 1857. No. **505**.

Island of St. Thomas.—In rather dense forests, at an elevation of 1800 ft., at Fazenda de Monte Caffé; fl. and fr. Dec. 1860. No. **507**.

CIX. MYRISTICACEÆ.

1. **MYRISTICA** L. Gen. Pl. edit. 2, p. 524 (1742); Ludw. Defin. Gen. Pl., edit. Boehmer, p. 513 (1760); Benth. & Hook. f. Gen. Pl. iii. p. 136.

Comacum Adans. Fam. Pl. ii. p. 345 (1763). *Pycnanthus* Warb. Monogr. Myrist. p. 130 (1897), & in Berl. Ber. Pharmac. Ges. 1892, p. 226. *Staudtia* Warb. Monogr. p. 128.

1. **M. angolensis** Welw. in Synopse Explic. p. 51, n. 137 (1862); Ficalho, Pl. Uteis, p. 246 (1884); Christy, New Commerc. Pl. no. 8, p. 26 (1885).

Myristicacea Welw. in Journ. Linn. Soc. iii. p. 150 (1 Feb. 1859), & Apontam. p. 554 sub n. 115. *M. Kombo* Baill. Adansonia ix. p. 79 (1868). *M. microcephala* Benth. in Hook. Ic. Pl. xiii. p. 48. t. 1261 (1878) *Pycnanthus microcephalus* Warb. in Berl. Ber. Pharmac. Ges., *l.c.* *P. Kombo* Warb. Monogr. p. 252, and Muskatnuss, p. 374. t. 4, fig. 9 (1897), var. *angolensis* Warb. Monogr. p. 257.

Golungo Alto.—A vast, majestic tree, 30 to 80 or 100 or even 120 ft. high; trunk reaching 3 to 5 ft. in diameter and more; the head ovoid, loosely branched; branches patent; the branchlets shining and distichous; leaves coriaceous, ferruginous-tomentose beneath, shining, distichous; flowers on the branchlets of 2 or 3 years' growth, below the leaves, corymbosely clustered, apetalous, cinnamon-ferruginous or dusky yellowish with a red-cinnamon tinge; the male flowers are arranged in large dense thyroid panicles and the whole panicles, and not the separate flowers, fall together; forming heaps on the ground under the male trees, they resemble droppings of human ordure, hence

the negro name "Mutûje," or "Mutûge" or "Entuge," plural "Matuge" (dirt tree); peduncles almost always unilateral, or rather the flowering branchlets are unilateral and secund; berries ellipsoidal, ribbed, when ripe bivalved, green, aromatic; aril fleshy, of a pretty rosy colour; the segments vertically erect, here and there anastomosing among themselves, strongly aromatic but very bitter; seed red-dusky, even when fresh readily inflammable and burning like tapers, abounding in a volatile oil. In primitive forests in the Sobatos of Bango, Quilombo, Bumbo, etc., plentiful; fl. Jan. to March, fr. July and August 1855; also a young branch at the Cuango river, June 1856. No. **781** (581 in Herb. Kew.). In secondary woods at the base of the mountains of Serra de Alto Queta; without fl. or fr., probably young states of this tree. Nos. **782***a* (Nov. 1855), **782***b* (May 1856), **782***c* and **782***d* (June 1856). In the Mata Grande de Queta; fr. end of July. COLL. CARP. 881. At Sange; in fr. COLL. CARP. 882.

This is the "Moscadeira Brava" (wild nutmeg tree) of Angola; both the fruits and the nuts of this African species are smaller than those of the Indian nutmeg, and cannot rival the latter in aroma; but they abound in oil, which in Welwitsch's opinion could be utilized for various domestic purposes, and probably also in pharmacy; the trees are very productive, each one bears many alquiers (23 pints) of fruits (see Welw. Synopse, *l.c.*). The Lichen n. 115 grew on this tree in the præsidium of Pungo Andongo in May 1857.

ISLAND OF ST. THOMAS.—In the primitive forests of Monte Caffé, at an elevation of 2000 ft.; fr. without leaves or fl. Dec. 1860. COLL. CARP. 883.

According to a MS. note of Welwitsch, "Mucûla-sucu" is the Mutuge de Sange; and in Sobato Bango it is called "Melevatango," or "M-levatango." In St. Thomas it is called "Cachão," and is used to make thin boards.

2. **M. macrocarpa** Welw. ex Christy, New Commerc. Pl. No. 8, p. 27 (1885); non Blume.

M. pterocarpa Welw. ex Warb. Monogr. Myrist. p. 243 (1897). *Staudtia pterocarpa* Warb., *l.c.*, and Muskatnuss, p. 386. t. iv. fig. 11 (1897). *Brochoneura pterocarpa* Warb., *l.c.*, t. viii.

ISLAND OF ST. THOMAS.—A tall tree; fruit quite $2\frac{1}{2}$ to 3 in. long by $1\frac{3}{8}$ to $1\frac{3}{4}$ in. in diameter, crustaceous-bivalved; aril entirely capsuliform, thickly fleshy-coriaceous, at length deliquescent, bright scarlet, truncate at the mouth. In the primitive forest; fr. Dec. 1860. COLL. CARP. 884.

CX. LAURACEÆ.

1. **CINNAMOMUM** Burm.; Benth. & Hook. f. Gen. Pl. iii. p. 155.

1. **C. zeylanicum** Blume, Bijdr. Fl. Ned. Ind. (xi.) p. 568 (1825); Ficalho, Pl. Uteis, p. 247 (1884).

Laurus Cinnamomum L. Sp. Pl. edit. 1, p. 369, n. 1 (1753). *Arbor Canella zeilanica* Breyn in Ephem. Acad. Nat. Cur., ann. iv. & v. p. 139 (1676).

BARRA DE DANDE.—A tree, 20 to 25 ft. high, with a widely spreading head. Cultivated at the banks of the river Dande near Bombo by Senhor Antonio Dias; fl. fallen Sept. 1858. Introduced from the Island of St. Thomas. No. **6431**.

PRINCE'S ISLAND.—Cultivated and almost wild; fl. Sept. 1853. Fr. seen in the mountainous parts of the island. No. **6430**.

2. **PERSEA** Plum. ; Benth. & Hook. f. Gen. Pl. iii. p. 156.

1. **P. gratissima** Gaertn. f. Suppl. Carpol. p. 222. t. 221 (1807) ; Ficalho, Pl. Uteis, p. 247 (1884) ; Henriques, Bol. Soc. Brot. x. p. 155 (1893).

Island of St. Thomas.—A handsome evergreen tree of moderate height ; fruit like a large pear in size and shape ; seed large, egg-shaped, embedded in sweet-acidulous pulp. Cultivated on Monte Caffé, about 2000 ft. alt. ; fl. and fr. Dec. 1860. Formerly introduced from Brazil and thriving well ; called "Abocate" or "Avacate," the alligator pear of the English. No. **6429**.

3. **CASSYTHA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 164.

1. **C. filiformis** L. Sp. Pl. edit. 1, p. 35 (1753).

Cassyta Guineensis Schum. & Thonn. in Danske Vid. Selsk. iii. p. 219 (1828).

Sierra Leone.—In wooded mountainous places about Freetown, plentiful ; fl. and fr. Sept. 1853. No. **6426**.

Pungo Andongo.—A climbing-twining plant, very densely covering the heads of trees and shrubs, as for instance "Muxillo-Xillo" (cf. *Vitex Cienkowskii* Kotsch. & Peyr.) and "Musuçu" (cf. *Gigalobium abyssinicum*), with coriacous tenacious golden-saffron, or like an egg-yolk in colour ; flowers pale yellow ; bracteoles at the base of the flowers about 3 ; style firm, acutely trigonous ; fruit scarcely becoming baccate ; seeds with their outer coat horny-hard and thick, and thin inner coat membranous and whitish. By the banks of the river Cuanza in Sobato de Cavallo, 20 geographical miles distant from the præsidium eastwards, sporadic but where present covering the broad heads of shrubs and trees with a golden yellow colour ; fl. and fr. 30 Jan. 1857. No. **6428**. On various trees close to the river Cuanza, between Condo and Quisonde, sporadic ; fl. and fr. 12 March 1857 ; also at Candambe near Sansamanda, plentiful ; fl. and fr. No. **6427**.

Benguella.—In small maritime woods near the city of Benguella, parasitical on *Acacia* trees (cf. *A. etbaica* Schweinf. ; Welw. herb. no. 1819), towards the river Catumbella ; fl.-bud June 1859. No. **6424**.

Mossamedes.—A shrublet or at least it might be called an under-shrub, climbing far and wide and to a great height, green-yellow or bright orange ; flowers always yellowish ; berries greenish-yellow, hard. In thickets close to the banks of the rivers Bero and Giraûl, ubiquitous, not uncommonly completely investing and overcoming species of *Acacia* and *Tamarix* (cf. *A. albida* Del., Welw. herb. no. 1824 ; and *T. orientalis* Forsk., Welw. herb. no. 1086) ; by the river Bero, July ; by the Giraûl 19 July 1859 ; fl. and fr. No. **6425**.

4. **HERNANDIA** Plum., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 164.

1. **H. beninensis** Welw. ex Ficalho, Pl. Uteis, p. 247 (1884) ; Henriques, Bol. Soc. Brot. x. p. 155 (1893).

Island of St. Thomas.—Leaves spuriously quinquenerved or subpalmatinerved, subpeltate or obliquely seated on the petiole which is attached a little within the blade ; flower-buds compact, somewhat fleshy, greenish white ; male flowers constantly trimerous ; the female flower intermediate. In the mountainous parts of the island, at an elevation of 1800 feet on Monte Caffé ; fl.-bud Dec. 1860. Negro name "Bunga." No. **1240**.

CXI. PROTEACEÆ.

Two suffruticose species of *Leucadendron* L. occur in Angola proper; they grow in great abundance, forming broad clumps on the rather dry hills and at the outskirts of forests in the neighbourhood of the great cataract of the river Cuanza from Bumba to near Quisonde; a third species, which is a small tree, was met with in the forests of Pedras de Guinga, but without flower or fruit; all the three species were found within the limits of an hour and a half's walk between Bumba and Condo, and there remained not the least trace of Proteaceæ elsewhere throughout the whole plateau of Angola proper.

The Proteaceæ of Huilla are all with one exception very local and restricted to very limited districts; the species of *Faurea* were seen in a very few stations and were represented by only few specimens, with the exception of *F. saligna* Harv.; during Welwitsch's frequent excursions, extending over eight months, across the wide highland plateau of Huilla, which is dotted with numerous mountain forests, he found only ten or twelve trees of one species of *Leucadendron*; and a similar statement applies to a species of *Faurea* with leaves glaucous beneath.

With reference to the peculiar geographical distribution of this Family in South Africa, Burchell remarked (Travels, i. p. 208) that on entering the Karro region, about 32° 40′ S. Lat., "four of the strongest and most characteristic features of Cape botany, the Ericæ, the Diosmæ, and the Proteaceous and Restiaceous tribes entirely disappeared," and that again seven degrees farther north *Protea argentea* L., the "wagenboom" of the Cape colonists, or at least a nearly related species, reappeared, although in the whole of the intervening country, where he botanized for two years, "this genus and several others which characterize the botany of the Cape were nowhere to be seen" (Burchell, *l.c.*, ii. p. 475); Dr. Kirk reported only one Proteacea from the whole of Zambesia.

In his letter addressed to Alph. de Candolle (in Archiv. Sc. Phys. Genève, July 1861, p. 11), Welwitsch showed that his discoveries led to the conclusion that on the west side of Africa the Cape flora extends towards the north, but that on the east side the tropical flora extends southwards towards the Cape; these observations thus confirmed the somewhat similar view of Drège in Flora, 1843, Besond. Beig. ii. pp. 19, 20.

In Welwitsch's opinion Proteaceæ are intimately related to Loranthaceæ; compare the perianth of *Faurea discolor* Welw.; Loranthaceæ, indeed, seem to be merely parasitical Proteaceæ. The scales or bracts subtending each flower in certain species of *Faurea* are really cupuliform, and are fixed on the rachis of the spike like an external calyx, possibly analogous to a corresponding condition in *Tricalysia* (Rubiaceæ). The hairs or beards of Proteaceæ are very changeable in colour; they are sometimes

however constant, and indeed in one species, namely *Faurea saligna* Harv., the beard on the pistil sometimes remains white, while in other cases it turns tawny or rufous. The marginate condition of the leaves or otherwise is frequently a bad character and difficult to distinguish. The limb of the perianth in some species is circumscissile and deciduous.

See Welw. Apontam. p. 548. n. 80, and p. 579. nota 9 (1859).

In Huilla the Proteaceæ are held in high esteem for firewood, and Welwitsch from his own experience confirmed their reputation.

1. **LEUCADENDRON** L. Sp. Pl. edit. 1, p. 91 (1753), partly; non R. Br. (1810); nec Salisb. (1807).

Lepidocarpus Adans. Fam. Pl. ii. p. 284 (1763). *Protea* R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 169; non L. (1753).

1. **L. angolense**.

Protea Angolensis Welw. Apontam. p. 586. n. 30 (1859) (*Protæa*); Engl. Hochgebirgsflora, p. 196 (1892).

Pungo Andongo.—An undershrub, 1½ ft. high; stems numerous from the polycephalous rootstock, straight or oblique, simple, one-headed, glabrous, greenish, sub-glaucescent; leaves glabrous, greenish, sub-glaucescent, acutely hyaline on the margin; head shortly turbinate at the base; the scales at first more or less silky-pubescent, soon glabrate, dusky reddish, the inner ones elongated, rather longer than the calyx, spathulate, densely silky-tomentellous from the base to the middle; calyx 2¼ in. long, the laminæ an inch long and bearded; style a little longer than the calyx; stigma almost ½ in. long, sigmoid at the base, gibbous. In wooded places among low bushes, near Banza de Bumba and Condo, at an elevation of 3500 feet, plentiful; fl. and young fr. end of March 1857. No. **1590**. Leaves pale green; flowers from whitish to rosy. At the outskirts of Leguminosæ forests (cf. *Pterocarpus*), the soil having a substratum of sandy schist, near the Condo cataract, at an elevation of 3400 feet, sporadic; fl. March 1857. A broad-leaved form. No. **1590***b*. An undershrub, 2 ft. high; stems cæspitose; flowers white, the involucres purplish. In thickets near Bumba (Songo Condo), at 4000 feet altitude; fr. March 1857. Coll. Carp. 887. At Condo; fr March 1857. Coll. Carp. 888.

Huilla.—A small tree, 6 to 8 or rarely 10 ft. high; trunk 3 to 4 in. in diameter, erect, loosely branched at the apex; leaves hard, coriaceous, rigid, glaucous-green; scales of the involucre velvety or silky-hoary or silky-pubescent, at length sometimes glabrate on the back and margin, the lower ones greenish, the upper ones white at the base and rosy at the apex, very rigid; flowers whitish; perianth-segments white, woolly, ⅔ to ¾ in. long or rarely longer; style whitish, 2½ in. long, but little thickened at the base; stigma ½ in. long, sigmoidly curved at the base; coma of the fruit rufous-ferruginous, softly silky. At the outskirts of rather open forests, on sandy mould, at the river Monino; fl. and fr. Feb. 1860. No. **1598**. A tree, 7 to 9 ft. high; trunk straight; flowers white, woolly; involucral scales whitish-rosy. In light forests close to the river Monino; fl. beginning of March 1860; fr. May 1860. Coll. Carp. 18. In the Monino forests; fr. April 1860. Coll. Carp. 892.

The specimens from Pungo Andongo appear to be dwarf forms of the species. The Fungus n. 154 grew on the leaves at Bumba in March 1857.

2. **L. micans.**

Protea micans Welw., *l.c.*, n. 31.

Pungo Andongo.—A widely cæspitose undershrub, 1 to 2 ft. high and more; rootstock hard-woody, polycephalous; stems numerous, simple or rarely forked at the apex, shaggy; leaves lanceolate, somewhat rigid, silky-hoary in the living state with long adpressed whitish remarkably glistening hairs, crowded, subsessile; flowers apparently white-rosy, not seen fresh; heads sessile among leaves longer than themselves; perianth elongated. In hilly places among low bushes near Bumba, between Quisonde and Condo, in company with *L. angolense*, seen only in one spot; fr. March 1857. No. **1589** and Coll. Carp. 889.

This and the last are the first two species mentioned by Welwitsch, Apontam. p. 579, note 9, and p. 548, n. 80.

3. **L. Welwitschii.**

Protea Welwitschii Engl. Hochgebirgsflora, p. 196 (1892).

Huilla.—A small tree, 12 to 20 ft. high or rarely more; trunk nearly a foot in diameter at the base; branches spreading, naked below, ramulose and leafy towards the apex; flowers white; perianth $1\frac{5}{6}$ in. long, hirsute or pilose with white hairs throughout; the lobes $\frac{2}{3}$ to $\frac{3}{4}$ in. long, linear-oblong, not aristate at the apex but subulately cucullate-corniculate with the little horns concealed among the hairs; the lip 3-lobed, densely and equally pilose on the whole of the outside including the middle of the back; anthers shorter scarcely by $\frac{1}{12}$ in. than the perianth-lobes, apiculate, the apiculus consisting of a tolerably large ovoid or elongated-ovoid erect brown somewhat fleshy obtuse gland; anther-cells found empty in the bud, having dehisced and already shed their pollen; style glabrous, $2\frac{1}{12}$ to $2\frac{1}{5}$ in. long, slender, somewhat compressed, furrowed in places, not or but little dilated in the middle, curved a little above the base, above the middle curved equally in the contrary direction, so as on the whole to describe as it were an elongated sigmoid bend; stigma about $\frac{3}{8}$ in. long, slender, gradually narrowed upwards, somewhat obtusely clavate-thickened at the apex. In one flower the tri-lobed lip of the perianth was somewhat callous on the middle of the back, where appeared an obscure thick nerve. In the more open very mixed forests on a sandy clay soil, at No Monino near Lopollo, and at Quilengues; fl. Feb. and end of March 1860, plentiful. No. **1600**. A tree, 15 to 25 ft. high; trunk 8 in. in diameter at the base; ramification somewhat lax; leaves disposed towards the tips of the branchlets, somewhat glabrous; flowers white, rather rarely rosy; perianth-segments all 4 densely white-shaggy, not tawny-silky on the back; involucral scales obtuse, silky-shaggy on the margin. In the Monino forests behind Lopollo, on a sandy clay or mould, plentiful; fl. Feb. to April 1860. A glabrate form. No. **1602**. In the sunny rocky parts of open mixed forests on a sandy clay soil between Lopollo and the Monino, sporadic. A half-naked form. No. **1604**.

The young plants appear to be very different in indumentum from the adult trees; they are often nearly tomentose and subsequently silky-shaggy; the leaves also are much narrower and more acute. Welwitsch noticed individuals on which one branchlet bore quite glabrous and another branchlet quite shaggy foliage.

The following two Nos., without flowers or fruits, should be compared with this species:—

Pungo Andongo.—A little tree, about 10 ft. high; trunk straight, $1\frac{1}{2}$ ft. in diameter at the base; branches long, erect-patent;

branchlets distant; leaves coriaceous, rigid, greenish, glaucescent, glabrous on both faces. In an elevated forest, about 3500 ft. elevation, near Pedras de Guinga, very rare; fl. March 1857. No. **1591.**

This is the third species of the genus mentioned by Welwitsch, Apontam. p. 579, Note 9, and p. 548, n. 80.

Huilla.—A shrub, 4 to 5 ft. high, erect, sparingly branched; branches erect-spreading; probably a young tree. In a hot mixed forest from Catumba towards Hay; March 1860. No. **1603.**

4. **L. leucoblepharum,** Hiern, sp. n.

A small tree, 12 to 15 ft. high; crown very lax; branches rambling, ascending, dusky, glabrate; branchlets pubescent and densely leafy at the tip; leaves oblanceolate or oblong-lanceolate, more or less obtuse at the apex, wedge-shaped at the subsessile base, straight or subfalcate, pilose or both faces with sparse hyaline glistening rather long adpressed hairs, membranous-herbaceous, somewhat rigid, not coriaceous, spreading, ciliate on the white sub-membranous entire margin, 4 to 6 in. long by $\frac{3}{4}$ to 1 in. broad; midrib whitish-rosy or yellowish, evanescent toward the apex of the leaf; flower-heads solitary at the apex of the branches of the previous year or accompanied by one or two lateral heads, obovoid-turbinate, about 2 in. long and broad; flowers rosy; involucral scales rosy, adpressed; the outer ones broadly ovate, silky-tomentose on the back, very obtuse, densely ciliate with a whitish cottony margin; the inner ones elongated, spathulate, about as long as the flowers, partly glabrate, bearded at the apex with rather long white hairs; perianth $1\frac{1}{2}$ to $1\frac{2}{3}$ in. long, densely shaggy nearly throughout with spreading or somewhat adpressed hairs; the lobes $\frac{1}{2}$ to $\frac{2}{3}$ in. long, linear, not aristate, in a hooded manner shortly corniculate with the little horns concealed by hairs, the intermediate one of the 3-lobed lip not shaggy but slightly pubescent or nearly bald on the back, rosy and without a nerve; anthers about $\frac{1}{2}$ in. long, shorter than the perianth; style naked, $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long, white, but little compressed-dilated in the middle, unisulcate especially toward the base, slightly curved under the stigma; stigma $\frac{1}{3}$ to $\frac{5}{12}$ in. long, obtuse and subclavate at the tip, somewhat furrowed, sometimes gibbous at the base.

Huilla.—In the more open of the Monino forests, sporadic; fl. end of Feb. 1860. No. **1599.** In the open mixed forests between Lopollo and the Monino, in company with other forms of this or allied species; fl. Feb. 1860. A form with broader and glabrate leaves, probably of this species. No. **1601.**

Nearly related to *L. Welwitschii*, but differs by the cottony margins of the involucral scales and the less hirsute character of the intermediate lobe of the perianth-lip.

Welwitsch thought that this tree might be *Protea abyssinica* Willd., the Abyssinian name of which is "Gunguedi"; he noted that the species, which is not rare in the mountainous part of the highland plateau of Huilla, is not there known by this name.

5. **L. paludosum.**

Protea paludosa Welw. ex Engl., *l.c.*, p. 196, name only.

A shrublet, $\frac{1}{2}$ to $1\frac{1}{2}$ ft. high; stems decumbent, densely leafy throughout, often almost hidden among grasses, shaggy, rather slender and wiry; leaves linear-oblong, mostly obtuse or subapiculate at the apex, obtuse sessile and but little narrowed at the base, coriaceous, rigid, thinly pilose on both faces, ciliate or ciliolate on the quite entire margin, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{6}$ to $\frac{3}{8}$ in. broad; heads of flowers very large in comparison with the size of the plant, handsome, turbinate, fixed at a right angle to the erect stems at the apex; involucral scales from whitish rosy to rosy purple, more or less obtuse, white-ciliate on the margin, the outer ones short ovate whitish at length dusky red and longitudinally plurisulcate-striate, the inner ones linear-spathulate or lanceolate erect much longer than the perianth and ranging up to $2\frac{1}{2}$ in. long; perianth densely shaggy with white spreading hairs, snow-white, $1\frac{1}{2}$ in. long or rather more; the segments exaristate, $\frac{1}{2}$ in. long, shortly subulate-apiculate; anthers $\frac{1}{4}$ in. long or rather more, linear, glabrous; pistil 2 in. long; ovary densely pilose with long stiff strong hairs, about $\frac{1}{4}$ in. long; style glabrous, tapering, about $1\frac{1}{2}$ in. long; stigma $\frac{1}{3}$ in. long, glabrous, narrow, truncate, capitellate at the apex.

Huilla.—On the wooded spongy slopes of pastures at an elevation of 5200 to 5500 ft., in Morro de Lopollo, Feb. and March 1860, in company with species of terrestrial *Utricularia*, *Xyris*, and Eriocauloneæ; fl. Feb. and March 1860. No. **1596**. A dwarf, decumbent undershrub; heads comparatively very large, with white flowers. In damp wooded pastures, above 5200 ft. of elevation; fr. May 1860. Coll. Carp. 121 and 895. In marshy very elevated meadows in Morro de Lopollo; fr. May 1860. Coll. Carp. 894. In Morro de Lopollo; fr. Perhaps this species Coll. Carp. 893.

6. **L. petiolare.**

Protea petiolaris Welw. ex Engl., *l.c.*, p. 197.

A tree, 12 to 20 ft. high; trunk $\frac{1}{2}$ to $1\frac{1}{2}$ ft. in diameter at the base; crown obovoid-hemispherical, dilated, with spreading rambling glabrate branches; branchlets puberulous or shaggy, densely leafy; leaves oblanceolate or narrowly elliptical, obtusely narrowed at the apex, attenuate at the base, rigidly coriaceous, glabrous, narrowly and acutely margined, petiolate, 3 to 6 in. long (including the petiole of $\frac{1}{2}$ to $1\frac{1}{2}$ in.) by $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, subfalcate, venulose on both faces; heads of flowers numerous, more or less obliquely placed at the ends of the branchlets, globose, whitish-rosy, handsome, almost hidden by the leaves; involucral scales glabrous or adpressedly silky or ciliolate, the outer ones short ovate or semicircular, the inner ones narrowly obovate-oblong, ranging up to $2\frac{1}{4}$ in. long, longer than or equalling the perianth; perianth $1\frac{1}{2}$ to $2\frac{1}{4}$ in. long, partly shaggy at the back with long pilose hairs, the limb $\frac{1}{2}$ to $\frac{7}{8}$ in. long, quite glabrous or obsoletely and sparingly bearded at the apex; anthers $\frac{1}{2}$ in. long; style $1\frac{5}{6}$ in. long, glabrous, straight but at the insertion of the stigma slightly sigmoid; stigma $\frac{1}{3}$ in. long, capitellate.

Huilla.—In open forests, on a sandy mould, in Morro de Lopollo,

above 5600 ft. of elevation ; fl. April 1860. No. **1597**. Forming little woods between Huilla and the Monino ; fl. and fr. Nov. 1859 and Jan. 1860. Coll. Carp. 890.

2. **FAUREA** Harv. (1847) ; Welw. in Trans. Linn. Soc. xxvii. p. 62 (1869) : Benth. & Hook. f. Gen. Pl. iii. p. 170.

Trichostachys Welw. Synopse Explic. p. 19. n. 46 (1862).

1. **F. saligna** Harv. in Hook. Lond. Journ. Bot. vi. p. 373. t. 15 (1847) ; Welw. in Trans. Linn. Soc. xxvii. p. 65 (1869) ; Engl. Hochgebirgsflora, p. 195 (1892).

Huilla.—A robust shrub, resembling a willow in habit, about 8 ft. high ; branches sparse and rambling, as well as the branchlets red-purplish or blood-red ; leaves narrowly lanceolate, subfalcate, 4 to 10 times as long as broad, acute, apiculate, attenuate at the base into the petiole, coriaceous, somewhat hard and shining ; inflorescence terminal, flowers in long spikes, pale yellowish, marcescent, each borne on a broad concave obtuse bract ; perianth thinly coriaceous, somewhat rigid, tubular, cleft down to a little above the base, the tube flattened and curved inwards, the limb with 3 spathulate cohering lobes and with one lobe free and spreading ; stamens 4, inserted a little below the apical concavity of the perianth-lobes ; filaments dilated, distinct ; anthers quasi-impressed on the apical concavity of the perianth-lobes, all equal and fertile ; hypogynous scales 4, ovate-triangular, pale yellowish, distantly free, adnate to the base of the perianth-tube inside ; ovary free, 1-celled, 1-ovuled ; style filiform, moderately curved upwards ; stigma thicker than the style, cylindrical-clavate, rather obtuse ; fruit bearded ; the beard white, turning yellow-dusky or tawny after drying, sometimes remaining white. In the mixed Monino forests, by the stream and in the Monino river itself ; frequent by clear streams and at cataracts, usually associated with *Eugenia* (cf. *E. guineensis*, var. *huillensis* ; Welw. herb. no. 4403) and willows (cf. *Salix subserrata* Willd. ; Welw. herb. nos. 6332, 6333), about Lopollo ; fl. from Nov. to Feb. and again in April and May ; fr. May 1860 ; in several places but nowhere abundant ; often mutilated by the flood waters. No. **1592**. A willow-like tree, 12 to 15 ft. high, with glaucous foliage. Huilla ; fl. and fr. Nov. 1859. Coll. Carp. 891.

Var. **platyphylla** Welw. ms. in herb.

Leaves broader, 1 to $1\frac{1}{3}$ in. broad ; petioles shorter, $\frac{1}{12}$ to $\frac{1}{4}$ in. long.

Huilla.—A small tree, 8 to 25 ft. high with rambling branches and a very lax crown, or oftener lower shrubby and barren ; leaves somewhat rigid and on both faces glossy ; flowers yellowish, sometimes resembling those of a *Loranthus*. In the denser and more elevated damp forests at the base of Morro de Monino, near Lopollo ; sparingly ; fl. beginning of April 1860. No. **1593**.

2. **F. discolor** Welw., *l.c.*, p. 64 ; Engl., *l.c.*

Huilla.—A shrub 6 to 8 ft. high or occasionally tree-like ; leaves constantly discolorous, more or less lanceolate, acute, apiculate, delicately tomentose-hoary on both faces ; the young ones less tomentose on both faces, hoary-pubescent above, afterwards glabrescent above ; the adult ones shortly but densely hoary-tomentose also beneath ; hypogynous scales ovate-deltoid, acute. In mixed sandy woods, composed chiefly of *Cæsalpinieæ* (cf. *Peltophorum africanum* Sond. ; Welw. Coll. Carp. 41), *Parinari* (cf. *P. Mobola* Oliv. ; Welw.

no. 1282), *Combretum* (cf. *C. psidioides* ; Welw. herb. no. 4379), *Eugenia* (cf. *E. guineensis*, var. *huillensis* ; Welw. herb. no. 4403), and *Leucadendron* (cf. *L. leucoblepharum*, Welw. herb. no. 1601), between Lopollo and Nene ; sparingly ; fl.-bud end of Feb. 1860 ; fl. and young fr. April 1860. No. **1594**.

Var. **cyclolepra**.

Hypogynous scales rounded, obtuse, subsemicircular, short.

Huilla.—A sparingly branched little tree, 8 ft. high, with a very lax crown. In bushy rocky places near Nene, very sporadic ; fl. beginning of May 1860. No. **1595**.

Fungus n. 126 grew on the leaves of this plant at Lopollo in May 1860.

3. **F. speciosa** Welw., *l.c.*, p. 63, t. 20 ; Eng., *l.c.* ; Ficalho, Pl. Uteis, p. 248 (1884).

Trichostachys speciosa Welw. Synopse Explic. p. 19. n. 46 (1862), and in Trans. Linn. Soc. xxvii. p. 94 (1869).

Huilla.—A very handsome tree, 10 to 12 ft. high, rarely 15 to 20 ft. ; trunk 6 to 8 in. in diameter at the base, in former times thicker as might be seen from the old remains ; the bark much cracked ; flowers orange-yellow. In the more elevated wooded rocky places among tall bushes and in open woods, between Lopollo and Humpata, sporadic ; fl. and young fr. April 1860. No. **1622**. A tree, 12 to 15 ft. high ; trunk 12 to 15 in. in diameter. In mountainous forests near Lopollo, at an elevation of 5600 to 6000 ft. ; fr. May 1860. Coll. Carp. 896.

Var. **lanuginosa**.

Leaves equally woolly-tomentose on both faces, obtuse.

Huilla.—A tree, 8 to 10 ft. high, with the habit of some Combretaceæ ; flowers orange-yellow. In small open woods very badly mutilated by shepherds, near Nene ; in late fl. beginning of May 1860. No. **1622***b*.

Var. **acutifolia** Welw. ms. in herb.

Leaves rather acute.

Huilla.—A tree-like shrub, with rambling and sparse branches and orange-coloured flowers. In the drier mixed forests between Eme and the lake Ivantâla, sporadic and rather rare ; fl. and young fr. end of April 1860. No. **1623**.

Var. **lucidula** Welw. ms. in herb.

Leaves rather glossy, obtuse.

Huilla.—A tree-like shrub, 7 ft. high, with rambling branches and orange-yellowish flowers. In mixed rather dense forests between Mumpulla and Cume da Xella, at an elevation of about 4000 ft., sporadic and rather rare ; in early fl. beginning of June 1860. No. **1624**.

CXII. THYMELÆACEÆ.

1. **GNIDIA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 197.

Lasiosiphon Fresen. (1838) ; Benth. & Hook. f., *l.c.* *Arthrosolen* C. A. Mey. (1843) ; Benth. & Hook. f., *l.c.*, p. 193. *Gnidiopsis* Van Tiegh. in Bull. Soc. Bot. Fr. xl. p. 75 (1893).

1. **G. involucrata** Steud. in Pl. Schimp. Abyss. ii. n. 770 (*U. i.*,

1842); A. Rich. Fl. Abyss. ii. p. 234 (1851); Engl. Hochgebirgsflora, p. 309 (1892).

Huilla.—A slender shrublet, 3 to 4 ft. high; stem erect; branchlets very numerous, densely leafy, many-flowered; leaves glaucous; flowers deep yellow, the involucres dusky orange, at length dusky black. In thin forests from Monino towards Quilengues; fr. and few fl. April 1860. No. **6481**. An erect, much-branched undershrub, woody at the base. In wooded places at the river Monino in the Quilengues country; fr. April 1860. Coll. Carp. 886.

2. **G. fulgens** Welw. Apontam. p. 548 sub n. 79 (1859) (*fulgene*); Britten, Journ. Bot. xxxiii. p. 75 (March 1895).

Gnidia sp., Welw. in Journ. Linn. Soc. iii. p. 155 (1 Feb. 1859).

A rigid herb, 1 to $1\frac{1}{2}$ ft. high; rootstock thick, woody, polycephalous, perennial; stems numerous, erect or ascending, subvirgate, more or less branched, glabrous, glaucescent; branches erect or ascending, glabrous, densely leafy; leaves alternate or crowded, sub-linear, acute at the apex, somewhat narrowed to the sessile base, glabrous, glaucescent, somewhat rigid, suberect or slightly diverging, $\frac{1}{3}$ to $\frac{2}{3}$ in. long by $\frac{1}{30}$ to $\frac{1}{10}$ in. broad; flowers about $\frac{5}{8}$ in. long, tetramerous, brilliantly scarlet, about 20 together arranged in terminal involucrate heads; peduncles bare of leaves, $\frac{3}{8}$ to 1 in. long, erect; involucral leaves 6, oval, obtuse at both ends, sessile, imbricate, glabrous or minutely glandular-scaly, striate-nerved, a little coloured about the apex and upper part of the margin, $\frac{1}{3}$ in. long by $\frac{1}{6}$ to $\frac{1}{5}$ in. broad; perianth-tube about $\frac{1}{2}$ inch long, often somewhat flexuous, clothed outside with white long or woolly hairs, glabrous inside, breaking across the middle; the lobes of the limb obovate, rounded at the apex, about $\frac{1}{8}$ in. long; scales 0; stamens 8, in two rows, glabrous, all included and reaching the same height, the upper 4 on short filaments opposite the perianth lobes and inserted a little below the throat, the lower 4 on longer filaments alternating with the others and inserted a little above the middle of the perianth-tube; style included, glabrous, falling short of the stamens.

Pungo Andongo.—At Mutollo, very rare, fl. Jan. 1857; also in marshy meadows near Sobato N-billa, plentiful, fl. March 1857. No. **6483**.

3. **G. Welwitschii** Hiern, sp. n.

An erect, rigid shrublet or undershrub or almost a shrub, 1 to 3 feet high, rootstock thick, woody; stems numerous, erect or ascending, simple or branched near the base, or sparingly branched above, glabrous, virgate; branches strict or erect, glabrous, leafy; leaves alternate or crowded, linear, acute or pointed at the apex, somewhat narrowed at the subsessile base, rigid, erect or suberect, glabrous, $\frac{1}{4}$ to $\frac{3}{4}$ in. long by $\frac{1}{50}$ to $\frac{1}{20}$ in. broad; flowers scarcely $\frac{1}{2}$ in. long, tetramerous, brilliantly vermilion or scarlet, about 24 together arranged in terminal involucrate heads, shortly pedicellate; peduncles bare of leaves, very short, erect; involucral leaves about 8, oval-obovate, obtuse or mucronate at the apex, somewhat narrowed towards the

obtuse base, coloured orange or reddish, glabrous or minutely glandular-dotted, striate-nerved, $\frac{1}{3}$ in. long by $\frac{1}{8}$ to $\frac{1}{6}$ in. broad; pedicels rather thick, bearded at the apex; perianth-tube slender, about $\frac{1}{3}$ in. long, puberulous with short hairs outside, glabrous inside, breaking across below the middle; the lobes of the limb broadly ovate, obtuse, $\frac{1}{12}$ in. long, pilose at the back; scales short, inserted at the perianth-throat; stamens 8, in two rows, glabrous, subsessile; the upper 4 opposite the perianth-lobes inserted near the throat and with the tips of the anthers just exserted, the lower 4 alternating with the others inserted above the middle of the perianth-tube and with smaller anthers; style apparently very short; fruit sub-ellipsoidal, obtusely somewhat prolonged at the apex, $\frac{1}{10}$ in. long, glabrous, surrounded at the base by the dense beard of the pedicel.

HUILLA.—In bushy pastures between Lopollo and Humpata, also in the open rather dry Monino forests, very plentiful; fl. Jan. to April; fr. April 1860. No. **6482**. In sunny wooded places at the river Monino and near Lopollo; fr. April 1860. COLL. CARP. 15. A very brilliant species.

4. **G. Rendlei** Hiern, sp. n.

A low shrublet; rootstock woody; stems prostrate or oblique, woody below, slender and wiry towards the extremities and branches, glabrous; branches densely leafy, prostrate or ascending; leaves linear or nearly so, approximated, subacute or pointed at the apex, a little narrowed at the subsessile base, glaucous-green, somewhat rigid, $\frac{1}{4}$ to $\frac{2}{5}$ in. long by $\frac{1}{40}$ to $\frac{1}{30}$ in. broad; flowers bright orange in colour, brilliant, quickly withering, marcescent, about 20 to 25 together crowded in sessile or subsessile involucrate upturned heads which terminate the branches or short lateral shoots; pedicels very short, rather thick, pilose at least at the apex; involucral bracts 6, obovate-oblong, sessile and obtuse at the base, apiculate at the obtuse apex, glabrous, striate-nerved, $\frac{1}{3}$ in. long by $\frac{1}{8}$ in. broad; perianth tetramerous, $\frac{1}{3}$ to $\frac{1}{2}$ in. long; the tube slender, pilose outside with white woolly hairs, glabrous inside, breaking transversely below the middle; the lobes roundly ovate, $\frac{1}{12}$ in. long; scales at the throat 0 or obsolete; stamens 8, in two rows, the upper 4 opposite the perianth-lobes inserted just below the throat and with the upper part of the anthers exserted, the lower 4 alternating with the others inserted above the middle of the tube and with smaller wholly included anthers; filaments very short; style short, included in the perianth-tube below its transverse fracture, glabrous.

HUILLA.—In hilly places where the mould is mixed with sand, among low bushes between Mumpulla and Nene, plentiful, in company with species of *Thesium* (cf. *T. lopollense*; Welw. herb. no. 6437) and *Acanthaceæ* (cf. *Thunbergia angolensis* S. Moore; Welw. herb. no. 5037); fl. end of Oct. 1859. No. **6478**. In hilly rocky sunny places among short bushes, between Lopollo and Catumba, rather rare; fl. and young fr. end of Nov. 1859. No. **6477**.

Clutia benguelensis Muell. Arg., Welw. herb. no. 338, in rocky

thickets near Mumpulla in Oct. 1859, grew in company with a *Gnidia*, probably this species.

5. **G. Hoepfneriana** Gilg in Engl. Bot. Jahrb. xix. p. 268 (21 Aug. 1894).

Lasiosiphon Hoepfnerianus Vatke ex Gilg, *l.c.*

Huilla.—Perianth pentamerous, sulphur in colour. In dry bushy sandy-earthy places between Mumpulla and Lopollo, plentiful; fl. Oct. and Nov. 1859. No. **6479**. An undershrub, with erect sparingly branched stems and yellow flowers; fr. Nov. 1859. Coll. Carp. 885. An erect undershrub, 1 to 2 ft. high; stems several from a big rhizome, sparingly branched; flowers seen only in a withered condition having apparently been yellow; heads in fruit thick. In rocky bushy pastures near Mumpulla, sporadic; late fl. and in fr. end of Oct. 1859. No. **6476**.

The following No. is apparently an undescribed species of *Gnidia*, related to *Arthrosolen flavus* Rendle :—

Huilla.—Stems several from a woody rootstock, suberect, glabrous, leafy, simple below, branched above; branches erect, leafy, glaucescent; leaves oblanceolate, very obtuse at the apex, narrowed to an obtuse shortly petiolate base, glabrous, glaucescent, $\frac{3}{4}$ to $1\frac{1}{4}$ in. long by $\frac{1}{10}$ to $\frac{1}{4}$ in. broad; fruiting peduncle nearly 3 in. long, erect, very sparingly pilose, nearly glabrate, dusky in the dry state; involucral leaves about 4, broad, dusky when dry, nearly glabrate; pedicels short, hispid with long white erect hairs at the apex. In hilly bushy places about the lake of Ivantâla; after the fall of the fr. Feb. 1860. No. **6480**.

CXIII. LORANTHACEÆ.

The number of species and also that of individuals of the same species increase progressively from the sea coast towards the highlands of the interior, and culminate in the mountainous forests of the districts of Pungo Andongo and Huilla at an elevation between 4000 and 6000 feet.

Nearly all the species are erect or more or less spreading shrubs from 1 to $2\frac{1}{2}$ ft. high, but one species forms a pendulous shrub with slender branches 4 to 6 ft. long. Most of the species of *Loranthus* as well as the single species of *Viscum* grow on the lower or higher or even on the top branches of evergreen trees, and less frequently on deciduous trees; only a few brilliantly flowering species occur in the torrid and treeless coast region, at the base of low shrubs of Malvaceæ and *Petalidium* very much in the same manner as *Cytinus Hypocistus* L. grows on *Cistus* on the sandy plains of Portugal; sometimes in the hot littoral region a beautiful *Loranthus* is met with growing, not at the base, but on the middle branches, or even on the main stem of low slender twiggy shrubs, and in such cases the combination of the bright green and broad-leaved parasite and its gay crimson flowers with the thinner and differently shaped foliage of the foster plant, forms one of the most striking features of parasitic vegetation along the sea coast of Benguella and Mossamedes; for instance, a small bush of *Gossypium* or allied genus, only 2 to 3 ft. high, bore several stems of a pink-flowered *Loranthus* nearly a foot

long; and again several low shrubs of the intensely glaucous *Tamarix orientalis* Forsk. had nearly all its principal branches decked with dense patches of the splendid yellow flowers of another *Loranthus*. The majority of the species in Angola have brilliant pink or scarlet flowers, but several have them golden or orange-coloured, and nearly all produce a profusion of flowers. The principal flowering season coincides in Angola with the spring, that is, from September till November, but many of the finest species continue their blooming almost throughout the summer, when they may be seen not uncommonly covered with ripe fruits at the base, while they are still in full flower at the top of the same branch. The yellow-flowered kinds, however, seem to begin their season much later, for several golden-blooming species open their flower in June and July, which in Angola is the very middle of the dry and cool winter. All the species have fleshy and rather broad leaves and vary considerably in colour, being in some species dark shining green, in others glaucous-green, and in a few species they are covered with a grey tomentum. Although some evince a decided preference for particular species of trees, not rarely the same species of *Loranthus* is found growing on trees belonging to quite different species or genera or even orders of plants; the pendulous *Loranthus*, however, was observed exclusively on a *Ficus*, while the *Viscum* affected only the arborescent Composite *Tarchonanthus camploratus* L.

The forest trees most frequently inhabited by Loranthaceæ are *Adansonia digitata* B. Juss., several of the larger trees of the orders Leguminosæ, Combretaceæ, Sterculiaceæ, and Sapindaceæ, as well as many of the various fig trees, while in the southern parts of Benguella and near Cabo Negro many beautiful species of *Loranthus* may be observed on *Tamarix orientalis* Forsk.; on the other hand a Loranthaceous parasite was never seen on trees belonging to the orders Anonaceæ, Hypericaceæ, Rutaceæ, or Euphorbiaceæ, although each of these orders is rather copiously represented by large and mostly evergreen trees in the forests of the Angolan highlands. Scarlet-flowered species of *Loranthus* were frequently seen to infest introduced trees, such as the Orange, Lemon, and *Ficus Carica* L., and it seems that these curious parasites emigrate with a kind of predilection from their original habitations to neighbouring fruit trees; on one occasion a whole orchard of orange trees was invaded with a bloodred-flowering *Loranthus*, and in another instance most of the trees in a fig-plantation were covered with a grey-leaved and yellow-flowering species; it seems also that the nature of the sap of the foster tree exercises little influence upon the vegetation of Loranthaceæ, for in several cases the same species grew with equal vigour on *Adansonia* which has a watery juice as on fig-trees of which the sap is milky and glutinous. This fact suggests the possibility and even the facility of introducing these pretty parasites into European gardens and conservatories, where they would furnish with their graceful forms a pleasing variety and

contrast. The species of *Loranthus* mostly prefer partial shade, while some like a denser shade and others again full light. Welwitsch suggested that an attempt should be made to cultivate the fine-flowered species of *Loranthus* on small orange or fig-trees; the berries could be easily introduced from the west coast of Africa, or they might there, (say) in Sierra Leone or Lagos, be planted on small species of *Ficus*, which these parasites especially affect, and they might then be forwarded together with the matrix in Wardian cases to Europe.

The most magnificent species of *Loranthus* are those which grow on *Acacia* and *Tamarix* trees, on account of the great contrast between the colour and foliage of the hosts and their parasites: for instance, *L. Gilgii* about Lopollo on a species of *Acacia* with yellow flower-heads and a fine pubescence, and *L. cinereus* and *L. Meyeri* in Mossamedes on *Tamarix orientalis* Forsk. Sometimes, though rarely, a *Loranthus* grew in large masses on most of the trees of an extensive forest; such an occurrence was observed in February 1855, in Golungo Alto, where a forest was covered as it were with a cherry-coloured mat, all the tree-tops being overgrown with the richly coloured flowers of a *Loranthus*.

See Welwitsch, Apontam. p. 553. n. 112 (1859), and in Gard. Chron. 1871, p. 835 (1 July).

1. **LORANTHUS** Vaill., L.; Benth. & Hook. f. Gen. Pl. iii. p. 207.

Sycophila Welw. ex Van Tieghem in Bull. Soc. Bot. Fr. xli. p. 485 (Sept. 1894). *Acrostachys* Van Tieghem, *l.c.*, p. 504. *Agelanthus* Van Tieghem, *l.c.*, xlii. p. 246 (June 1895). *Oncocalyx* Van Tieghem, *l.c.*, xlii. p. 258 (June 1895). *Phragmanthera* Van Tieghem, *l.c.*, p. 261. *Metula* Van Tieghem, *l.c.*, p. 263. *Septimetula* Van Tieghem, *l.c.*, p. 266. *Tapinanthus* Van Tieghem, *l.c.*, p. 267. *Acrostephanus* Van Tieghem, *l.c.*, p. 267.

1. **L. combretoides** Engl. Nat. Pflanzenfam., Nachtrag, p. 128 (1897).

Sycophila combretoides Welw. ex Van Tieghem, *l.c.*, xli. p. 486. *L. Mannii*, var. *combretoideus* Engl. Bot. Jahrb. xx. p. 81 (16 Nov. 1894), non Oliv.

Pungo Andongo.—Sarmentose-scandent, with the habit of a *Combretum*; branches 6 ft. long, hanging down and waving in garlands; flowers fleshy-coriaceous, yellowish, tetramerous, racemose; anthers 2-celled, the cells with several subsidiary cells, almost honeycombed. On the island of Calemba, between Quisonde and Condo, in the river Cuanza; growing on the long pendulous sarmentose branches, scarcely as thick as a finger, of *Ficus pendula* Welw. ex Van Tieghem., *l.c.*, p. 486, Welw. herb. no. 6359; fl. March 1857. No. **4852**.

2. **L. Welwitschii** Engl. Bot. Jahrb. xx. p. 87, t. 1, fig. B. (16 Nov. 1894).

Oncocalyx Welwitschii Van Tieghem in Bull. Soc. Bot. Fr. xlii p. 740 (1896).

Mossamedes.—A shrublet, 1 to 2½ ft. high, branched from the base;

branches patent, virgate, dusky-black ; leaves glaucous, fleshy, brittle, ovate-lanceolate : flowers yellow ; perianth-tube whitish and inflated at the base, above narrowed and green, then during the flowering obliquely bent ; the lobes 5, yellow ; ovary green, narrowly ellipsoidal and scarlet when ripe, one-seeded. By the rocky sides of the river Bero, parasitical on the branches of *Tamarix orientalis* Forsk. (see *ante* p. 55) ; fl. and fr. end of July 1859. The swelling of the branchlet of the matrix at the base of the attached parasite is nearly spherical, as large as a moderate-sized walnut, depressed, and very hard, though juicy. No. **4883**.

3. **L. glaucocarpus** Peyr. in Sitz. Akad. Wien, xxxviii. p. 571 (1860), *ex descript.*

L. cistoides Welw. ex Engl., *l.c.*, p. 103 ; *Phragmanthera* sp., Van Tieghem in Bull. Soc. Bot. Fr. xlii. p. 262 (June 1895).

Pungo Andongo.—An intricately branched shrublet, 1 to 3 ft. high, whitish-tomentose throughout ; flowers of a wine-orange colour ; fruit blue when ripe. On the small tree "Molulu" in Compositæ (cf. *Vernonia senegalensis* Less. ; *ante* p. 528) and on *Citrus Medica* L., frequent on the latter ; fl. and young fr. end of Oct. 1856. No. **4848**. A much-branched shrublet, 1 to 3 ft. high, scaly-hoary throughout ; perianth-tube from greenish to very pale yellow, tomentose outside, the lobes at the apex spathulate and rosy purple. On various trees such as *Citrus Aurantium* L., *C. Medica* L., *Spondias Mombin* L. ("Munguengue" ; cf. Welw. Coll. Carp. 359), *Gardenia* (cf. *Randia andongensis* Hiern ; Welw. herb. no. 3096), and on cultivated plants of *Ficus Carica* L. ; far too abundantly infesting the præsidium ; fl. middle of Jan. 1857. Seen also on *Dichrostachys platycarpa* Welw. herb. no. 1797. No. **4847**.

Benguella.—In open sandy maritime forests near Benguella, together with two other species of *Loranthus*, parasitical on *Cordia* (cf. *ante*, p. 713) ; fl.-bud June 1859. No. **4853**.

Mossamedes.—Flowers yellow, always veiny. By the banks of the river Maiombo below Cazimba on the branchlets of *Tamarix orientalis* Forsk. ; fl. Oct. 1859. No. **4857**.

Welwitsch proposed to place this species in a new subsection of the genus, with the character :—Flowers pentandrous, fasciculate 3 or 4 or rarely more together, each flower provided with a leaf-like bract.

4. **L. fulvus** Engl., *l.c.*

Phragmanthera sp., Van Tiegh., *l.c.*

Huilla.—A beautiful plant with orange-coloured flowers. In the Monino forests, growing on *Dodonæa viscosa* Jacq. (Welw. herb. nos. 1691 and 1692 ; *ante*, p. 172) and on a Combretacea (cf. *Combretum holosericeum* Sond. ; *ante*, p. 350 ; Welw. herb. no. 4379), seen nowhere else ; fl. beginning of Feb. 1860. No. **4886**.

5. **L. cinereus** Engl., *l.c.*, p. 103. t. 2, fig. C.

Phragmanthera sp., Van Tiegh., *l.c.*

Mossamedes.—A densely branched shrublet, 1 to 1½ ft. high ; leaves fleshy, brittle, pale green, flowers pallid rosy, floccose-hoary, purple inside ; stamens and style orange-coloured. Near S. João do Croque, Rio Croque, Cabo Negro, plentiful, growing on *Tamarix orientalis* Forsk. (cf. *ante*, p. 55) and the Composita "Quitoco" (cf. *Pluchea Dioscoridis* DC. ; *ante*, pp. 557–558) ; fl. 3 Sept. 1859. No. **4884**.

6. **L. Sterculiæ** Hiern, sp. n.

A parasitical shrub, 5 to 7 ft. high ; branches dusky or ashy,

asperulous; branchlets mostly spreading horizontally, strongly tuberculate, puberulous with small compound articulate pallid hairs, leafy; leaves alternate or oftener ternate or even quarternately sub-verticillate, ovate-oblong, more or less obtuse at the apex, nearly rounded or subcordate at the base, coriaceous, very bright green above, pallid and lepidote-hoary beneath, 2 to 3 in. long by $\frac{2}{3}$ to $1\frac{2}{5}$ in. broad, entire and narrowly revolute on the margin, the younger ones whitish-tomentose on both faces; petiole $\frac{1}{3}$ to 1 in. long, more or less hairy or scaly; flowers $1\frac{3}{4}$ to 2 in. long, sulphur-yellow, shortly pedunculate, very densely clustered in fascicles, tomentose; the perianth straight, 5-lobed; the lobes valvate in æstivation, linear-spathulate, $\frac{1}{2}$ in. long; the tube narrowly cylindrical, about $1\frac{1}{3}$ in. long, 10-nerved, slightly tapering from the middle downwards, somewhat thickened about the base, stellate-hairy outside, minutely puberulous-scaly inside; epicalyx short, whitish-tomentose; anthers $\frac{1}{20}$ in. long; filaments stout, inserted about the throat of the perianth, twisted, $\frac{2}{5}$ in. long, not toothed at the apex; style nearly equalling the perianth; flower-buds yellow, rigid, fleshy; young fruit $\frac{1}{4}$ in. long.

Golungo Alto.—On wooded slopes by the river Delamboa, growing on a *Sterculia* (Bondo iá Molemba; cf. *ante*, p. 82) and other deciduous trees and usually clothing with its dense mass the topmost branches of their heads; fl. beginning of Sept. 1855. No. **5283**. In forests at the right bank of the river Delamboa on Sterculias and Acacias; young fr. Jan. 1856. No. **5284**. On the right hand side of the Ambaca road, growing as it seemed exclusively on the upper branches of a Malpighiaceous (?) tree; fl. 13 Sept. 1856. No. **5285**.

Nearly related to *L. cinereus* Engl.

7. **L. Zygiarum** Hiern, sp. n.

A parasitical shrub, 2 to 3 ft. high, growing on the branches of a species of *Albizzia*; branches dusky, rambling, quite patent, rigid, tuberculate; branchlets at the extremities and young parts puberulous or tomentellous with short stellate or articulate tawny hairs; leaves opposite or subalternate, crowded, oval, rounded or obtuse at both ends, fleshy-coriaceous, subglaucous-green, without gloss, glabrous or nearly so above, more or less spread with small scattered stellate-scales beneath, $1\frac{1}{4}$ to $2\frac{3}{4}$ in. long by $\frac{2}{3}$ to $1\frac{1}{3}$ in. broad; petiole $\frac{1}{4}$ to $\frac{3}{8}$ in. long; flowers splendidly scarlet, about $1\frac{3}{4}$ in. long, slender, glabrous or nearly so, on short pedicels arranged in lateral clusters several together on the branchlets; epicalyx sub-hemispherical, green, small, wavy at the short free entire margin; bracts small; perianth-tube about $1\frac{1}{8}$ in. long, about $\frac{1}{12}$ in. in diameter, cylindrical throughout or very little dilated about the top; the lobes 5, sublinear, broader at the base, slightly spathulate towards the apex, about $\frac{1}{2}$ in. long; filaments 5, glabrous, opposite to the perianth-lobes, $\frac{1}{4}$ in. long, rather thick, twisted, inserted about the throat, not toothed at the apex; anthers $\frac{1}{12}$ in. long, glabrous, attached at the base; style glabrous, about equalling the perianth; young berries globose, green.

Golungo Alto.—By the banks of the river Delamboa rather rare,

and in the Capopa forests rather plentiful ; fl. and young fr. beginning of Nov. 1855. No. **5281**.

Related to *L. oreophilus* Oliv., but the leaves are very obtuse.

8. **L. anguliflorus** Engl., *l.c.*, p. 107.

Huilla.—Flower-buds yellow-reddish, verging on scarlet. In wooded mountainous places at the lake of Ivantâla, growing on a Cæsalpiniaceous tree with the habit of a tamarind (cf. *Brachystegia tamarindoïdes* Welw. herb. no. 585 ; *ante*, p. 301) ; fl.-bud end of Feb. 1860. No. **4887**.

9. **L. angolensis** Engl., *l.c.*, p. 101.

Metula sp., Van Tiegh., *l.c.*, p. 263.

Golungo Alto.— A bard, woody shrublet, 2 to 3 in. high ; branches twisted ; leaves coriaceous, rigid, somewhat glossy above, more or less ferruginous-tomentose beneath ; flowers orange-brickred, somewhat rigid and dry, brittle. In rather elevated forests in Sobato Quilombo, parasitical on "Musondo," that is, *Pseudospondias microcarpa* Engl. (See *ante*, pp. 176, 177) ; fl. middle of July 1856. No. **4844**.

Benguella.—Between Benguella and the river Catumbella, growing on a species of *Cordia* ; without either fl. or fr. June 1859. Determination doubtful. No. **4870**.

10. **L. Engleri** Hiern.

L. emarginatus Engl., *l.c.*, p. 100 ; non Swartz (1788).

Septimetula sp.. Van Tieghem, *l.c.*, p. 266.

Pungo Andongo.—Stems 2 to 3 ft. high ; leaves glossy ; flowers from blood-red to scarlet. In the præsidium growing on Sapotaceous plants (cf. *Chrysophyllum cinereum* Engl. ; Welw. herb. no. 4823 ; *ante*, p. 640), rather rare ; fl. Nov. 1856. No. **4849**.

11. **L. cinnameus** Hiern, sp.n.

A rigid, comparatively robust shrub, with nearly straight and subglabrescent branches patent or spreading at about half a right angle with the stem ; branchlets tomentose with rufous stellate jointed rather short hairs ; internodes mostly shorter than the leaves, rather thickened ; leaves opposite, patent, subsessile, ovate-oblong, obtuse at the apex, cordate at the base, fleshy-coriaceous, dark or glaucous green, glabrous or glossy above, paler or brown and shortly stellate-tomentellous sometimes almost obsoletely so beneath, 3 to 5 in. long by 1 to $1\frac{1}{2}$ in. broad, the young ones densely clothed with a cinnamon-coloured tomentum ; young fruits ellipsoidal or obovoid, very shortly pedicellate, arranged several together in subsessile clusters lateral on the branchlets in the axils of fallen leaves, densely clothed with a cinnamon-coloured tomentum consisting of rather short branched jointed stellate hairs, about $\frac{1}{4}$ in. long, $\frac{1}{5}$ in. broad, $\frac{1}{6}$ in. thick, surmounted with a short saucer-shaped rim about $\frac{1}{15}$ in. in diameter surrounding the base of the fallen style.

Pungo Andongo.—In the little woods of the præsidium, very rare, growing on Spondiaceæ (Mucumbi), (cf. *Calesiam antiscorbutica*, *ante*, p. 179) ; young fr. March 1857. No. **4846**.

Appears to be related to *L. hirsutissimus* Engl. There is a specimen in the National Herbarium in flower from the Congo collected by Christian Smith which perhaps belongs to this species.

12. **L. brunneus** Engl., *l.c.*, p. 88.
Agelanthus brunneus Van Tiegh., *l.c.*, p. 738 (1896).

Pungo Andongo.—An erect or ascending shrub, growing in masses as if forming thickets on the branches of Leguminous and other trees; leaves compactly coriaceous, with melastomaceous nervation; flowers blood-red, often densely covering chiefly the lateral branchlets. In the forests of Pedras de Guinga and Mutollo, growing on Cæsalpinieæ with a tamarind-like habit (cf. *Brachystegia tamarindoides* Welw.; and Welw. herb. no. 572, *ante*, p. 302); scarcely well-developed fl. Jan. 1857. No. **4850**.

13. **L. Henriquesii** Engl., *l.c.*, pp. 88-89, as to n. 4885, not as to n. 4881.

Huilla.—Flowers whitish-rosy. Near Mumpulla, on Panda trees (cf. *Brachystegia spicæformis* Benth.; Welw. herb. no. 578; *ante*, p. 300); fl.-bud Oct. 1859. No. **4885**.

14. **L. glomeratus** Engl., *l.c.*, p. 89.
L. Henriquesii Engl., *l.c.*, pp. 88-89, as to n. 4881, not as to n. 4885. *Agelanthus glomeratus* Van Tiegh., *l.c.*, p. 738.

Huilla.—Flowers whitish-rosy (?). In Panda forests, on *Gardenia Jovis-tonantis* Hiern, Welw. Coll. Carp. 168 (partly), *ante*, p. 461; near the lake Ivantâla; not yet in good fl. end of Feb. 1860. No. **4880**. In forests between Nene and Jâu, on *Parinari Mobola* Oliv. (cf. Welw. herb. no. 1282 and Coll. Carp. 1; *ante*, p. 320); in young fl.-bud April 1860. No. **4881**. In forests about Lopollo; in young fl.-bud Dec. 1859. No. **4881***b*.

This species should perhaps be reduced to the last, but if distinct No. 4881 is better placed here.

15. **L. Gilgii** Engl., *l.c.*, p. 91.
Agelanthus Gilgii Van Tiegh., *l.c.*, p. 738.

Huilla.—A very elegant much-branched shrublet; leaves glaucous; flowers white, purplish at the base and apex. On trees of Combretaceæ (cf. *Combretum holosericeum* Sond.; *ante*, p. 350; Welw. herb. no. 4379) plentiful, and on Mimoseæ (cf. *Acacia robusta* Burch.; Welw. herb. no. 1833; *ante*, p. 314) rarely; in the Lopollo country; fl. Dec. 1859. Not uncommonly in company with three or even four other species of *Loranthus*. No. **4893**.

16. **L. Buchneri** Engl., *l.c.*, p. 114, partly, t. 2. fig. E.

Ambriz.—A shrub, virgate-erect, 3 to 6 ft. high, sparingly and patently branched; leaves rigidly coriaceous, from glaucous to green; flowers peach-red, the older ones turning to orange-scarlet; berries from red to green when ripe. In maritime thickets composed of a Celastrinea (cf. *Gymnosporia senegalensis* Loesener; *ante*, p. 145; Welw. herb. no. 1361) behind the port of Ambriz, growing parasitically at the roots of a Malvacea (probably a species of *Sida*) though at first sight terrestrial and not parasitical; fl. and fr. Nov. 1853. No. **4842**. A shrub 5 to 7 ft. high; leaves opposite, fleshy, glaucous; flowers axillary, subsessile, tubular, red. At the mouth of the river Loje, not obviously parasitical; fl. and fr. Nov. 1853. Coll. Carp. 937.

No. 4854, which is also quoted by Engler, *l.c.*, p. 115 for this species, has sessile and more crowded leaves and the flower-buds are rounded and not truncate at the apex; I have referred it to *L. sessilifolius* Pal. Beauv.

17. **L. constrictiflorus** Engl., *l.c.*, p. 119. t. 3, fig. B.

Golungo Alto.—A shrublet, 3 ft. high and more ; leaves glaucous-green, fleshy-coriacous ; flowers prettily red. Throughout the elevated region of Sobato de Quilombo, 2200 feet altitude, plentiful, growing on various wild and cultivated trees ; also on wild orange-trees ; fl. end of Jan. 1855. No. **5282.**

I have not seen the types of this species, which belong to Central Africa and Angola, but the description and figure agree fairly well with Welwitsch's plant.

18. **L. sessilifolius** Pal. Beauv. Fl. Owar. ii. p. 8. t. 63 (1807).

L. Buchneri Engl., *l.c.*, pp. 114–115, as to n. 4854, not as to n. 4842.

Benguella.—Flowers blood-red. In sandy thickets near Benguella, growing on the Acanthaceous shrublet *Petalidium glandulosum* S. Moore, *ante*, p. 810 (which was a smaller and weaker plant than its parasite) ; fl. June 1859. No. **4854.**

Bumbo.—Branches spreading. Near Bruco, growing on a species of *Eugenia* (cf. *E. benguellensis* Welw. herb. no. 4394 ; *ante*, p. 360) ; fl. Oct. 1859. No. **4862.** A glaucous shrub ; flowers blood-red, subsessile, bracteate at the base ; bracts cup-shaped forming a double epicalyx. In Serra da Xella above Bruco, growing on various trees ; fl. Oct. 1859. No. **4863.**

Huilla.—Flowers splendidly blood-red. In the more elevated parts of Morro de Lopollo, growing on *Parinari Mobola* Oliv. (cf. *ante*, p. 320) ; fl. Nov. 1859. No. **4866.** A much-branched shrublet, 1 to 1½ ft. high ; leaves glaucous ; flowers blackish purple ; perianth-lobes green before expansion ; anthers red ; stigma green-purplish. In the Lopollo country, plentiful, growing on Combretaceæ ; fl. 2 Dec. 1859. No. **4865.** Stems rigid, brittle, longitudinally rugulose, ashy ; leaves fleshy-coriaceous, glaucous, very brittle ; flowers bloodred-purple, very handsome. In very elevated parts of Morro de Lopollo, growing on Proteaceæ ; fl. Feb. 1860. No. **4867.**

19. **L. Meyeri** Presl, Bot. Bemerk. p. 76 (1844), in Abh. Böhm. Gesellsch. Wissensch. ser. 5, iii. p. 506 (1845).

L. namaquensis Harv. in Harv. & Sond. Fl. Cap. ii. p. 577 (1862). *L. oleæfolius* E. Mey. ex Harv., *l.c.* ; non Cham. & Schlecht. (1828).

Var. **ligustrifolius** (Engl., *l.c.*, p. 120).

Benguella.—Flowers blood-red. Between Benguella and the river Catumbella, sporadic, growing on a species of *Acacia* with yellow heads of flowers (cf. *A. etbaica* Schweinf. ; *ante*, p. 314 ; Welw. herb. no. 1819) ; fl. June 1859. No. **4882.**

Mossamedes.—A shrublet, 1 to 2 ft. high, branched from the base, growing on low shrubs ; branches dichotomous, as well as the branchlets brittle ; leaves glaucous, somewhat fleshy ; flowers somewhat fleshy, green at the base and at the apex, somewhat ventricose and purple in the middle. In sandy places by the river Bero, on *Gossypium* or allied genus ; fl. beginning of July 1859. No. **4858.** A shrublet, 1 to 2½ ft. high, branched from the base ; leaves succulent, glaucous ; flowers brilliantly bloodred-purple. Near Cavalheiros, growing on an arborescent species of *Cordia* (cf. *ante*, p. 713) ; fl. beginning of July 1859. No. **4859.** Flowers blood-red. By the banks of the river Maiombo growing on various Mimosas and other trees ; fl. Oct. 1859. No. **4860.** A shrublet, as brittle as glass. By the river Maiombo, growing on "Umpeque" shrubs (*Ximenia americana* L. ; *ante*, p. 140 ; Welw. herb.

no. 1130), rare and seen only on one shrub; few fl.-buds Oct. 1859. No. **4861**. Berries green-purplish. At the Maiombo, climbing on *Tamarix* (cf. *T. orientalis* Forsk.; *ante*, p. 55; Welw. herb. no. 1086) and on "Umpeque"; fr. Oct. 1859. No. **4855**. A very rigid shrublet, $1\frac{1}{2}$ ft. high; stem and branches swelling in the middle; leaves lanceolate, glaucous, very sparse, erect; flowers blood-red. On the mountainous parts of Cazimba not far from the banks of the river Maiombo, not plentiful, growing on the branchlets of Mimosas; fl. and very few leaves Oct. 1859. No. **4876**. A slender, glaucous, virgately branched shrublet, 1 ft. high. In bushy sandy places at the banks of the river Maiombo, near Pedra de Sal, growing on shrubs of Olacineæ (cf. *Ximenia americana* L., *ante*, p. 140); in young fl.-bud Oct. 1859. No. **4856**.

Huilla.—A branched shrublet, 1 to 2 ft. high; stem nodose, brittle; branches ascending, reddish dusky; leaves glaucous. Near Humpata, parasitical on *Osyris abyssinica* Hochst. (Welw. herb. no. 6438); without fl. or fr. end of Oct. 1859. Apparently this species. No. **4879**.

Apparently on the leaves of this plant the Fungus n. 212 grew at Cavalheiros in July 1859; it is, probably, this species of *Loranthus*, the seeds of which are enveloped in a very sticky gummy matter, which is used as birdlime and also as gum for sealing letters. See Monteiro, Angola, ii. p. 205 (1875).

20. **L. bumbensis** Hiern, sp. n.

A smooth, somewhat pallid, but little branched shrub; branches nearly straight; internodes, at least the upper ones, shorter than the leaves; leaves mostly opposite or nearly so, spreading, ovate or oval-oblong, obtuse at the apex, broad near or not far from the obtuse or nearly rounded base, fleshy-coriaceous, glabrate, minutely glandular-scaly, shortly petiolate, 1 to $2\frac{2}{3}$ in. long by $\frac{1}{2}$ to $1\frac{1}{3}$ in. broad; petiole about $\frac{1}{8}$ in. long; flowers about $1\frac{3}{4}$ in. long just before expansion, $1\frac{1}{2}$ in. long when the lobes are reflected, brilliant, blood-red, several together in abbreviated axillary cymes; peduncles and pedicels very short, puberulous, rather thick; bracts cupular, usually with a small deltoid lip on one side, puberulous; calyculus with a small free wavy or lobulate ciliolate cup-shaped border, puberulous outside; perianth tubular, puberulous outside; the tube with a globular enlargement ($\frac{1}{3}$ in. in diameter) at the base, then abruptly contracted and narrowly funnel-shaped above, at length split down one side, and spreading out nearly flat above; the lobes 5, linear-spathulate, fleshy, thickened and pointed at the apex, about $\frac{1}{4}$ in. long, at length revolute at or below the middle; filaments 5, rather shorter than the perianth-lobes, each with a short tooth at the apex, for some time connivent, at length free and separate and much curved in the open flower; anthers $\frac{1}{12}$ in. long; style puberulous, equalling the (straightened) perianth, angular about the top of the included portion, thinner above; stigma exserted.

Bumbo.—Near Bumbo, parasitical on Acacias; fl. Oct. 1859. No. **4864**. Nearly related to *L. Meyeri* Presl.

21. **L. dependens** Engl., *l.c.*, p. 117.

L. pendulus Welw. ex Engl., *l.c.*; non Sieb. *Acrostephanus dependens* Van Tieghem in Bull. Soc. Bot. Fr. xlii. p. 268 (June 1895).

Pungo Andongo.—A shrub of 4 to 10 ft. high, hanging a long way down ; leaves glossy, deep green ; flowers very crowded, deep blood-red, very handsome. Near Mutollo and at Candumba, growing on a species of *Citrus* and on the Leguminosa called "Mucumba" (cf. *Tounatea madagascariensis* Taub. ; *ante*, p. 286) ; fl. Jan. 1857. No. **4851**.

22. **L. Belvisii** DC. Prodr. iv. p. 303 (1830); Engl., *l.c.*, p. 108. n. 67.

L. lanceolatus Pal. Beauv. Fl. Ow. ii. p. 8. t. 64 (1807) ; non Ruiz & Pavon (1802).

Golungo Alto.—Leaves subglaucous-green ; flowers scarlet. In elevated situations among the Queta mountains, growing on aged trees of *Ficus* (cf. *F. trachyphylla* Fenzl ; Welw. herb. no. 6389) ; fl. Dec. 1855. No. **5279**. A shrublet, 3 to 4 ft. high ; branches $\frac{3}{4}$ in. in diameter at the base ; branchlets flexuous-twisted, rigid, ternately or quaternately verticillate, covered with a grey corky-scarred bark ; leaves opposite, fleshy, brittle, ovate or ovate-oblong, glaucous-green, almost without gloss, pervaded with sordidly purple veins, nearly always mutilated by insects ; flowers fleshy, purple, pubescent ; perianth-segments linear-spathulate, cohering in a long tube, at the time of the flowering with the tube burst at the apex into 5 strictly reflected lobes ; filaments comparatively long, equal, 5, erect in the bud and embracing the style, twisted inwards spirally and elastic at the time of the flower ; anthers rosy, oblong, basifixed ; style filiform, gradually thickened upwards, a little narrowed below the stigma where it is encircled by the anthers ; stigma oblong or ellipsoidally capitate, green. Between Sange and Bango in wooded places, parasitical on the same *Ficus* as the previous no. ; fl. and fr. 1 May 1856. No. **5280**.

23. **L. Mechowii** Engl., *l.c.*, p. 118.

Loanda.—A divaricately branched shrub, 2 to 3 ft. high, parasitical on the branches and branchlets of *Adansonia digitata* B. Juss. ; leaves fleshy-coriaceous, glaucous ; the young fruits ellipsoidal. In rather elevated hilly places near Boa Vista ; fl. and young fr. May 1858. No. **4843**, and (stem, May 1854) Coll. Carp. 938.

This is probably the glaucous-leaved *Loranthus* with deep red flowers, nearly covering the *Adansonia*, which is mentioned by Welwitsch in Proceed. Linn. Soc. ii. p. 329 (1854).

Fungus n. 32 grew on the leaves of this parasite.

Engler, *l.c.*, p. 119, quotes again Welw. no. 4843 for his form *Welwitschianus* of this species, with leaves subacute at the base, for a specimen with this No. belonging to the Coimbra university herbarium.

24. **L. mollissimus** Engl., *l.c.*, p. 119.

Bumbo.—In shady places between Bruco and Chão da Xella, parasitical on various trees ; fl. Oct. 1859. No. **4877**.

Huilla.—Leaves very caducous ; flowers scarlet. In forests near the Monino, plentiful, parasitical on *Eugenia* (cf. *E. guineensis* var. *huillensis*, *ante*, p. 359 ; Welw. herb. no. 4403) and Sapotaceæ (cf. *Chrysophyllum argyrophyllum* Hiern, *ante*, p. 641) ; fl. Jan. 1860. No. **4888**.

25. **L. Molleri** Engl., *l.c.*, p. 120.

Pungo Andongo.—Leaves rigidly coriaceous, subglaucous ; flowers orange-yellow, at length in the dry state turning purple. On the Calemba island in the river Cuanza, growing chiefly on the tree "Mucáge" (cf. *Combretum lepidotum* (A. Rich.), *ante*, p. 347, = *C. Welwitschii* Engl.) ; fl. March 1857. No. **4845**.

26. **L. villosiflorus** Engl., *l.c.*, p. 125.

Huilla.—Flowers brilliantly scarlet. Between Nene and Lopollo, growing on Combretaceous and other trees; fl.-bud Dec. 1859. No. **4892**. Leaves nearly all mutilated by insects; flowers brilliant, orange-rusty in colour, very handsome. In the great *Parinari* forests to the east of Lopollo, growing on *P. Mobola* Oliv. (*ante*, p. 320; Welw. herb. no. 1282), plentiful; fl. beginning of Jan. 1860. No. **4891**. Flowers orange-red. In the Monino forests, very plentiful on one Acacia-like tree called "Muboço" (cf. "Musoso," *Gigalobium abyssinicum*; Welw. herb. no. 1782*b*, *ante*, p. 306), not seen on any other tree in the neigbourhood; fl. Jan. 1860. A form with narrower leaves and flowers smaller and less shaggy than the previous nos., perhaps a distinct species. No. **4890**. Flower-buds yellowish-ashy. In the Monino forests, very rare, a parasite on a species of *Ficus* (cf. Welw. herb. no. 6369); fl.-bud Jan. 1860 (afterwards searched for in vain). Probably a form like the last no., but too young for determination. No. **4889**.

27. **L. Kirkii** Oliv. in Journ. Linn. Soc. vii. p. 101 (1863); Engl., *l.c.*, p. 129; Oliv. in Hook. Ic. Pl. xiv. p. 6. t. 1309 (April 1880). *Acrostachys Kirkii* Van Tieghem in Bull. Soc. Bot. Fr. xli. p. 504 (Sept. 1894).

Mossamedes.—Flowers very yellow, turning to orange. By the Maiombo, climbing on a species of *Cordia* (cf. *ante*, p. 713); fl. Oct. 1859. No. **4872**. Flowers saffron-coloured; berries yellow. By the Maiombo, growing on the branchlets of an arborescent *Cordia*; fl. and fr. Oct. 1859. No. **4873**. Flowers of a brilliant orange-colour. By the sandy banks of the river Maiombo near Cazimba and Pomangala, growing on the branches of a species of *Cordia*; fl. Oct. 1859. No. **4874**.

Bumbo.—Berries blackish purple. In the heart of the mountains of Serra de Xella, growing on Combretaceæ; fr. Oct. 1859. Perhaps a different species or possibly the variety *populifolius* Engl., *l.c.*, p. 130, the type of which I have not seen. No. **4871**.

Huilla.—Flowers deep yellow. Near the Bruco rivulet at the base of the mountains of Serra de Xella, growing on the tree "Unteate" (*Copaiba Mopane* O. Kuntze; *ante*, p. 303; Welw. herb. no. 605); fl. and fr. Oct. 1859. No. **4878**.

The following No. is without fl. or fr.; it differs from this species in having the branchlet and petioles more or less clothed with short thick-set spreading hairs; it perhaps belongs to an undescribed species:—

Mossamedes.—At the Maiombo, climbing on a species of *Acacia*; Oct. 1859. No. **4875**.

2. **VISCUM** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 213.

1. **V. tuberculatum** A. Rich. Fl. Abyss. i. p. 338 (1847).

Huilla.—The whole plant green or turning from green to tawny, brittle; the larger shrublets 1 to 2 ft. long, pendulous from the branchlets of the foster plant; flowers yellowish; berries nearly oblong, reddish. In elevated parts of Serra de Xella, near Mumpulla, growing on the tree *Tarchonanthus camphoratus* L. (*ante*, p. 554; Welw. herb. nos. 3522 and 6745); fl. and fr. Oct. 1859. No. **4868**. In the Catumba rocky forests, rather rare, growing on *Tarchonanthus*; fr. Dec. 1859. No. **4869**.

CXIV. SANTALACEÆ.

Before Welwitsch's time Santalaceæ were thought to be absent from west tropical Africa; their discovery in Pungo Andongo and Huilla was therefore important, and is one of the best proofs of the relationship which exists between this flora and that of the Cape of Good Hope, where numerous species of *Thesium* have been found. One of the species, *T. virgatum* Welw., has quite the habit of *Thymelæa arvensis* Lam., while the rest of the Angolan species much resemble the European species of *Thesium*, especially those with prostrate stems.

1. **THESIUM L.**; Benth. & Hook. f. Gen. Pl. iii. p. 221.

1. **T. strigulosum** Welw. ms. in herb.

A perennial herb, with the habit of the genus, rough throughout with short rigid hairs; rootstock woody, polycephalous; stems prostrate or ascending, patently setulose-hirsute, 6 to 12 in. long, wiry, subterete, branched mostly in the lower part; branches shortly flagelliform, slender; leaves alternate, subulate, acute, $\frac{1}{15}$ to $\frac{1}{12}$ in. long, or the lower ones sublinear and obtuse, all uni-nerved, not decurrent; flowers yellowish, $\frac{1}{15}$ to $\frac{1}{12}$ in. long, on very short pedicels, in the axils of bracts shorter than themselves, together forming long narrow terminal bracteate spikes and also sometimes short lateral ones; bracts several, some of them in a whorl around the flowers, subulate; free portion of the perianth $\frac{1}{50}$ in. long, 5-cleft, shortly campanulate, puberulous outside; the segment deltoid-ovate, glabrous inside; stamens 5; filaments very short, inserted on the perianth-tube; anthers oblong, $\frac{1}{50}$ in. long; lower portion of the fruit ellipsoidal-oblong, $\frac{1}{24}$ in. long, not ribbed, tubercular; style glabrous, exceeding the anthers; stigma capitellate, included.

Pungo Andongo.—In rocky thickets near Condo; fl. and fr. March 1857. No. **6432.**

2. **T. rectangulum** Welw. ms. in herb.

An annual, strictly erect, glaucescent, wiry herb, 1 to $1\frac{1}{2}$ ft. high, minutely or obsoletely puberulous, branched like a broom, branches acutely angular or somewhat winged in consequence of the leaves being decurrent; leaves about $\frac{1}{8}$ to $\frac{5}{8}$ in. long, mostly alternate, sub-linear, acute, adpressed; flowers whitish, terminal, $\frac{1}{12}$ in. long, very shortly pedunculate, erect; free portion of the perianth $\frac{1}{20}$ in. long, campanulate subhemispherical and deeply 5-lobed in flower, persistent lengthening more cylindrical and with a longer tube in fruit; the lobes ovate-lanceolate, thickened, hooded at the apex, not bearded; stamens 5; filaments inserted about the middle of the base of the perianth-lobes; anthers shortly oblong, shorter than the lobes; style exceeding the anthers, shorter than the perianth; fruit including the persistent perianth $\frac{1}{6}$ in. long, the lower part globose, $\frac{1}{12}$ in. in diameter, ribbed and transversely veined.

Huilla.—In thickets and hilly hot places near Lopollo, sparingly, fl. 2 Dec., 1859 ; also in wooded meadows near Catumba, not plentiful, fl. and fr. Jan. 1860. No. **6436.**

3. **T. andongense** Hiern, sp. n.

A hard, annual, virgately much branched, nearly glabrous herb, 3 to 4 ft. high or more ; stem marked with narrow foliaceous wings below, at the base furnished with 2 opposite linear leaves, leafless above; flowers about $\frac{1}{10}$ in. long, from greenish to yellowish, very shortly pedicellate, arranged in slender spicate racemes; pedicels with 3 small bracteoles at the base ; free portion of the perianth campanulate, 5-cleft, about $\frac{1}{12}$ in. long, marcescent, not bearded inside, the lobes ovate-deltoid ; stamens 5, inserted at the base of the perianth-lobes and opposite to them ; filaments flattened, scarcely bearded; anthers oblong, included ; ovary almost wholly inferior ; style included, exceeding the stamens, filiform ; stigma capitellate ; fruit including the marcescent perianth about $\frac{1}{8}$ in. long, $\frac{1}{12}$ in. in transverse diameter, hard, greenish, ribbed, between the ribs transversely obliquely and thickly veiny, 2-seeded.

Pungo Andongo.—In thin bushy sandy rocky forests, not far from the river Cuanza, near Mopopo ; fl. and fr. 22 Feb., 1857. No. **6434.**

4. **T. equisetoides** Welw. ms. in herb.

A minutely puberulous, nearly glabrescent, wiry herb; root-stock thick, woody, polycephalous; stems prostrate, whip-like, branched, with the habit of an *Equisetum*, slender ; branches alternate, angular ; leaves comparatively few, subulate, acute, sessile, somewhat decurrent, opposite or alternate, $\frac{1}{20}$ to $\frac{1}{10}$ in. long ; flowers terminal, bracteate at the base, solitary, $\frac{1}{12}$ to $\frac{1}{10}$ in. long, greenish ; free portion of the perianth persistent, about $\frac{1}{20}$ to $\frac{1}{15}$ in. long, shortly cylindrical, deeply 5-lobed ; the segments lanceolate, not bearded inside, obtuse, the tips and sides narrowly inflected ; anthers shortly oblong, included ; style included, exceeding the stamens ; bracts subulate, $\frac{1}{20}$ to $\frac{1}{15}$ in. long ; lower portion of the fruit $\frac{1}{10}$ in. long by $\frac{1}{12}$ in. in diameter, ribbed, the ribs jointed with oblique venation.

Pungo Andongo.—In sandy wooded places near Cazella on the left bank of the river Catete ; fl. and fr. Jan. 1857. No. **6433.**

5. **T. lopollense** Hiern, sp. n.

A dwarf, obsoletely puberulous, spreading shrublet, 2 to 8 in. high, much branched from the base; rootstock rather thick, woody, perennial ; branches slender, wiry, angular, leafy at least upwards, the more spreading ones ascending towards the apex ; leaves alternate, lanceolate-subulate or subulate, acute at the apex, rather thick, the sides curved inwards below, broadest sessile and decurrent at the base, $\frac{1}{10}$ to $\frac{1}{5}$ in. long ; flowers subsessile, terminating the branches and the upper short or very short lateral shoots, each solitary, together forming terminal leafy narrow panicles or more or less secund spicate racemes, about $\frac{1}{7}$ in. long ; the very short pedicels rather fleshy, with 4 or

5 approximated ciliolate leaves at the base; free portion of the perianth $\frac{1}{20}$ to $\frac{1}{14}$ in. long, shortly cylindrical or wider upwards, persistent, divided nearly to the base; segments 5, lanceolate, obtuse, with an incurved apiculus at the tip, fleshy, concave with narrowly incurved thinner papillose sides except the base, glabrous or nearly so; anthers lanceolate, short, included in the perianth, glabrous; filaments rather short, glabrous; ovules 3; style thick, exceeding the stamens, rather shorter than the perianth, glabrous; lower part of the fruit subglobose, glabrous, crustaceous, nearly $\frac{1}{12}$ in. in diameter, longitudinally ribbed, the ribs joined with oblique or sinuous thickly marked veinlets; endocarp lined inside with spongy scales; seed solitary.

Huilla.—In pastures near Lopollo among low bushes and plants of Euphorbiaceæ (cf. *Clutia benguelensis* Muell. arg.; Welw. herb. no. 338), *Gnidia* (cf. *G. Rendlei*; Welw. herb. no. 6478), and *Ascolepis*; fl. and fr. Dec. 1859 and Jan. 1860. **No. 6437.**

6. **T. Welwitschii** Hiern, sp. n.

A nearly glabrous undershrub, about 1 ft. high, perennial; rhizome creeping horizontally, throwing up numerous crowded erect or suberect virgate wiry stems; stems simple at the base or nearly so, much branched towards the apex; branches angular, marked with the lines of the decurrent leaves; leaves mostly alternate, narrowly linear, acute, sessile, decurrent, $\frac{1}{4}$ to $\frac{2}{3}$ in. long; flowers about $\frac{1}{8}$ in. long, bracteolate at the base, on short pedicels, arranged in terminal somewhat compound racemes; pedicels bracteate at the base, approximated at the apex of the inflorescence; bracts $\frac{1}{6}$ to $\frac{1}{3}$ in. long; bracteoles shorter than the flowers; free portion of the perianth about $\frac{1}{12}$ in. long, urceolate or campanulate-hemispherical, 5-cleft, persistent; the lobes bearded inside, ovate-deltoid, subobtuse; filaments inserted near the bases of the perianth-lobes, short; anthers subquadrate; style included, not exceeding the anthers; fruit including the marcescent perianth $\frac{1}{5}$ in. long, ovoid-conical, $\frac{1}{8}$ in. in transverse diameter, ribbed and obliquely cross-veined.

Huilla.—In sandy wooded thickets, in the Humpata country, between Mumpulla and Nene, very rare elsewhere; fl. and few fr. Oct. 1859. **No. 6435.**

Habit somewhat of *T. pycnanthum* Schlechter in Engl. Bot. Jahrb. xxvii. p. 120 (7 April 1899), but the flowers are not capitate to the same extent. As to companionship, see *Thunbergia angolensis* S. Moore, *ante*, p. 804, Welw. herb. no. 5037.

2. **OSYRIS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 227.

1. **O. abyssinica** Hochst. in Pl. Schimp. Abyss. i. n. 281 (*U. i.*, 1840); Flora 1841, Intellig. i. p. 22 (name only); A. Rich. Fl. Abyss. ii. p. 236 (1851).

Fusanus alternifolia, Br. in Salt, Abyss., App. p. lxiii. (1814), *nomen.*

Huilla.—A much-branched shrub, 4 to 6 ft. high; branchlets green, angular; leaves elliptic-ovate, glaucous, somewhat fleshy; flowers

diœcious, trimerous, yellowish; berries scarlet, oblong-globose. In the thickets of Jâu, Humpata, and Lopollo, plentiful; fl. and fr. Oct. to Dec. 1859. No. **6438**.

Clutia benguelensis Muell. arg., Welw. herb. no. 338, grew in company with this plant in rocky thickets near Mumpulla in Oct. 1859.

CXV. EUPHORBIACEÆ.

The plants of this order in Angola are distributed alike in the three principal regions, but with this difference, that each region has its predominant set of forms. In the coast region the arborescent cactus-like forms, with the habit of *Cereus* or *Hariota*, are the most notable, and they communicate to their stations, where they are massed in forests, a very peculiar physiognomy. In the mountainous wooded region these leafless trees disappear, or they occur only in cultivation, and, instead of them, the forests and hills are furnished with climbing species of multiform aspect, at times resembling the Convolvulaceæ, as in the case of *Dalechampia*; the Urticaceæ, as in *Tragia*, *Acalypha*, and *Croton*; and the Leguminosæ, as in some species of *Phyllanthus*. Arborescent forms do not fail to be represented, and such trees are in habit sometimes like the Tiliaceæ, Rhamnaceæ, or Lauraceæ, or even the Menispermaceæ. In the high plateau region there occur, in addition to some of the arborescent forms of the latter region, in other cases and in greater abundance the cactus-like euphorbias, representing, however, in this region by preference the fleshy Opuntia-like forms.

The timber of the woody species is nearly always of very good quality, white and firm, sometimes yellowish white, and then it mostly more or less resembles box-wood; *Euphorbia Candelabrum* and its allies are, however, exceptions to this general rule.

Two species of Euphorbia, namely *E. Candelabrum* and *E. Tirucalli*, in Loanda, as well as *Jatropha Curcas* in Golungo Alto, provide the negroes with pitchers or stakes that take root readily when driven in the ground, and grow rapidly even where no other shrub or tree can live, and for this reason they are frequently used for making fences round the huts or villages of the natives.

A material for a black dye, called "Dunce," is obtained from *Alchornea cordata* in Golungo Alto, and from *Lepidoturus occidentalis* in Pungo Andongo.

Tragia and *Dalechampia* contain stinging species; *T. cordifolia* stung Welwitsch after it had been kept ten years in his herbarium.

The milk which exudes from the species of *Euphorbia* is not so injurious as is often reported. On one occasion, when Welwitsch was shooting wild birds in Cacuaco near Loanda, the milky sap from *E. Candelabrum* was squirted in great quantity right into his eyes; but after washing them for ten minutes with cold sea-water, he suffered no affection of his eyesight. On another

occasion Welwitsch's Cabinda, while chopping off a large Polyporeous fungus (cf. Fungus, n. 357) from the roots of *E. Tirucalli*, encountered a similar accident with the milk of the latter, but without any serious consequences. On the other hand, Monteiro, Angola, ii. p. 267 (1875), states that the acrid milky juice of the euphorbias is very dangerous to the eyes if it should drop into them, and that the natives employ the juice of *Sanseviera angolensis* Welw. as a remedy.

The negroes discriminate with tolerable exactness some of the species: for example, in Golungo Alto the natives call one species of *Croton* by the name of "Mubango," and another species "Mubango ià muxito," that is, "Wood Mubango"; and in Pungo Andongo a third species is called "Mubango de Cabondo." *Tragia cordifolia* was usually pointed out to Welwitsch as the "Casãoção," but they called by the same name the equally stinging herb *Dalechampia scandens*. In a similar manner the dye-plants, *Alchornea cordata* and *Lepidoturus occidentalis*, in Golungo Alto and Pungo Andongo respectively, are called by the name of "Dunce."

1. **EUPHORBIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 258.

1. **E. pilulifera** L. Sp. Pl., edit. 1, p. 454 (1753), non Herb.; Boiss. in DC. Prodr. xv. 2, p. 21 (1862).

Sierra Leone.—Stems pubescent with jointed hairs. On mountain slopes behind Freetown; fl. and fr. Sept. 1853. No. **288**.

2. **E. decumbens** Forsk. Fl. Ægypt.-Arab. p. cxii. n. 313 (1775); Willd. Enum. Pl. Hort. Berol., Suppl. p. 27 (1813).

E. indica Lam. Encycl. Méth. ii. p. 423 (1786); Boiss., *l.c.*, p. 22. Cf. *E. glaucophylla* Poir. Encycl. Méth. Suppl. ii. p. 613 (1811); Boiss., *l.c.*, p. 14.

Ambriz.—In damp places by the river Quizembo; fl. and fr. Nov. 1853. No. **294**.

Barra do Dande.—Annual. In poor, sparingly herbaceous, sandy places by the coast between the mouths of the rivers Dande and Bengo, at Praia de S. Thiago; not uncommon; fl. and fr. Sept. 1858. No. **295** and Coll. Carp. 912.

Bengo.—Annual. At the banks of the river Bengo; fr. Feb. 1858. Coll. Carp. 910.

Loanda.—From annual to triennial. In sandy and gravelly maritime parts of Ilha dos Passaros, plentiful; fl. and fr. 3 May 1854. No. **292** and Coll. Carp. 911. In sandy sparingly herbaceous places from Maianga d'El Rei towards Praia do Bispo; fl. and fr. May 1859. No. **293**.

Golungo Alto.—On poor ground with sparse herbage at the outskirts of the forest near Sange, rather rare; fl. and fr. Feb. 1856. No. **290**.

Pungo Andongo.—In hot gravelly parts of the præsidium, near Catete; fl. and fr. May 1857. No. **291**.

Perhaps not distinct from *E. hypericifolia* L. Cf. Welw. in Ann. Cons. Ultramar. No. 7 (Aug. 1854), p. 83, n. 77, and Apontam. p. 564, sub n. 153 (1859).

3. **E. macra** Hiern, sp. n.

A green-glaucous, perennial herb, glabrous or minutely glandular-papillose, much branched at and near the base; rootstock rather thick or wiry; lower branches erect or spreading in many directions, short, 2 to 3 in. long, slender, leafy; upper branches sometimes comparatively elongated, very slender, erect, less leafy, and 6 to 12 in. long; leaves opposite, narrow, linear-subulate, acute or apiculate at the apex, sessile, connate at the base, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, rather fleshy, often not flat but more or less folded laterally; margins entire; stipules obsolete; inflorescence terminal and occasionally axillary; heads of flowers subsessile, solitary; involucre campanulate, somewhat compressed, $\frac{1}{12}$ in. long, minutely glandular-pulverulent outside; lobes rather small, ovate, somewhat cut or fringed; glands 4 or 5, transversely oval, sub-peltate, not cornuate, narrowly bordered, about $\frac{1}{24}$ to $\frac{1}{20}$ in. in the greatest horizontal diameter; bracteoles narrow, hairy, some at least exceeding or equalling the filaments; pistil stipitate; stipe glabrous, at length exceeding the involucre, thickening towards the apex; capsule obtuse, glabrous, $\frac{1}{6}$ in. long, nearly as broad, smooth; seeds about $\frac{1}{8}$ in. long, obtusely angular, marked with coarse wrinkles; styles distinct nearly to the base, bifid.

Huilla.—In poor, sparingly bushy, rather dry pastures, between Lopollo and Nene; fr. April 1860. A short leafy form. No. **284**. In hilly and rather poor bushy places near Lopollo; fl. and fr. April 1860. A very slender, comparatively elongated, and less leafy form. No. **284***b*.

It was probably on the living leaves of this plant that the fungus n. 128*a*, *Æcidium Welwitschii* Lagerheim, grew at Lopollo in March 1860.

4. **E. Serpicula** Hiern, sp. n.

A dwarf, prostrate herb, spreading in all directions, branched from the base, apparently perennial; root comparatively thick; stems hirsute with pallid spreading hairs, leafy, 1 to 2 in. long; leaves opposite, oblong-ovate or ovate, obtuse with a mucro at the apex, obliquely rounded at the base, somewhat fleshy, glabrous or sparingly ciliate near the base, somewhat reddish cartilaginous-revolute and entire on the margin, $\frac{1}{6}$ to $\frac{1}{5}$ in. long, $\frac{1}{12}$ to $\frac{1}{10}$ in. broad, shortly petiolate, spreading; midrib somewhat depressed above; lateral veins inconspicuous; stipules reduced to a transverse thickening; inflorescence axillary; heads of flowers solitary, on hirsute peduncles of $\frac{1}{12}$ to $\frac{1}{10}$ in. long; involucre broadly campanulate, nearly glabrous outside, a little hairy inside; lobes deltoid-ovate, small, ciliate-fringed; glands 4, transversely oval, about $\frac{1}{24}$ in. in the greatest horizontal diameter, not cornuate, subpeltate, thick and dark purple with a thinner paler corolliform broad conspicuous appendage or border on the outer side; pistil exserted, stipitate, hairy, $\frac{1}{12}$ in. long, $\frac{1}{10}$ in. broad; stipe hairy, shortly exserted, curved and often recurving above; seeds $\frac{1}{10}$ in. long, glabrous, obtusely angular, foveolate-wrinkled.

HUILLA.—In hot places at the outskirts of the forest, near and above Mumpulla, among sparse herbage, rare ; fl. and fr. Oct. 1859. No. **279**.

5. **E. nenensis** Hiern, sp. n.

A glabrous, glaucescent, decumbent, apparently perennial herb ; loosely branched from the base ; root rather thickly wiry ; branches 4 to 6 in. long ; branchlets ascending, slender ; internodes mostly longer than the leaves ; leaves opposite or three together, lanceolate or sublinear, acute at the apex, somewhat narrowed to the sessile somewhat oblique base, entire, somewhat fleshy, erect or spreading, $\frac{1}{4}$ to nearly 1 in. long by $\frac{1}{15}$ to $\frac{1}{8}$ in. broad ; stipules gland-like ; inflorescence terminal ; flower-heads solitary, subsessile, $\frac{1}{5}$ to $\frac{1}{4}$ in. long ; involucre broadly campanulate, glabrous ; lobes ovate, small, fringed, subequal ; glands 4, transversely oval, about $\frac{1}{20}$ in. in the broadest diameter, not cornuate, dark, whitish on the narrow minutely crenulate margin ; capsule obtuse, stipitate, $\frac{1}{5}$ in. long, $\frac{1}{6}$ in. broad, glabrous ; stipe exserted ; seeds angular, irregularly marked with oblique and transverse wrinkles, $\frac{1}{8}$ in. long ; styles 3, free nearly to the base, contiguous, glabrous, $\frac{1}{15}$ in. long, bifid.

HUILLA.—In elevated pastures among low herbage on a somewhat sandy soil, near Nene, non-plentiful ; fl. and fr. Oct. 1859. No. **280**.

6. **E. prostrata** Ait. Hort. Kew. edit. 1, ii. p. 139 (1789) ; Welw. Apontam., *l.c.* ; Boiss. Ic. Euphorb. t. 17 (1866), and in DC., *l.c.*, p. 47.

SIERRA LEONE.—In sandy maritime places near Freetown ; fl. and fr. Sept. 1853. No. **650**.

LOANDA.—An erect herb, annual or lasting for several years, with ascending basal branches ; leaves somewhat fleshy ; flowers pale yellowish. In grassy rather dry places near Penedo ; fl. and fr. beginning of Dec. 1857. On sandy clay flooded in summer, also on the seashore about Loanda, plentiful but not ubiquitous ; near Imbondeiro dos Lobos ; fl. and fr. May and June 1858. In herb. Kew. under this No. there is also another species. No. **647**. Imbondeiro dos Lobos ; fr. March 1858. COLL. CARP. 908. An annual prostrate herb with the stems and branches lying close to the ground and spreading in all directions. On drying-up clay near the coast ; fr. June 1858. COLL. CARP. 909. Annual, on a sandy clay soil near Conceição ; fr. beginning of July 1854. COLL. CARP. 914.

MOSSAMEDES.—In sandy maritime places and on the neighbouring hills, between the mouth of the river Giraûl and the town of Mossamedes ; fl. and fr. 18 July 1859. A small hairy form. No. **648**.

HUILLA.—On rough declivities between Nene and Lopollo, plentiful ; fl. and fr. Nov. 1859. No. **278**.

PRINCE'S ISLAND.—In sandy maritime places at Bahia de S. Antonio ; fl. and fr. Sept. 1853. No. **649**.

CAPE DE VERDE ISLANDS.—In maritime places at Porte grande de Mindello in the Island of St. Vincent ; Aug. 1853. Only one specimen. No. **649***b*.

This species is certainly related to *E. Chamæsyce* L., and difficult to distinguish from it.

The following No., consisting only of a detached leaf and some loose fruits, differs from *E. prostrata* Ait. (to which it was doubt-

fully referred by Welwitsch) in the marks on the seeds, etc., but the material is insufficient for exact naming :—

Loanda.—Leaf oval-oblong, obtuse at both ends, glabrous, entire, slightly unequal at the base, $\frac{3}{8}$ in. long, $\frac{1}{9}$ in. broad ; veins few, not conspicuous ; petiole very short, glabrous ; fruit oblately spheroidal, $\frac{1}{20}$ to $\frac{1}{18}$ in. long, $\frac{1}{15}$ in. in diameter, dusky glabrous, depressedly globose ; seeds bluish grey, $\frac{1}{30}$ to $\frac{1}{25}$ in. long, in the shape of a segment of an oblate spheroid, regularly and minutely tubercular-dotted, the tubercles reddish, numerous, arranged in about three unequal longitudinal curved rows on the two plane faces and in about six longitudinal rows on the curved back, each of the six rows lying in an imaginary plane containing the straight inner edge of the seed ; seeds also marked with numerous very inconspicuous delicate transverse wrinkles on the curved back and even less conspicuous ones on the two plane faces. In dry places, near Morro das Logostas ; March 1854. Coll. Carp. 907.

7. **E. andongensis** Hiern, sp. n.

A glabrescent, glaucescent, prostrate, perennial herb, branched from the base ; root thickening ; stems 3 to 6 in. long ; branches trailing, leafy, the barren ones puberulous or pubescent towards the apex ; leaves broadly oval or rotund, rounded or subemarginate at apex, more or less oblique and cordate at the base, somewhat fleshy, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, opposite, those of the barren shoots ranging up to $\frac{1}{2}$ in. long by $\frac{1}{3}$ in. broad, entire, shortly petiolate ; midrib and veins not conspicuous, depressed on the upper face ; stipules small, fimbriate-subulate at the apex or on the barren shoots limited to a transverse line or border ; inflorescence axillary ; heads of flowers solitary, on peduncles ranging up to $\frac{1}{8}$ in. long ; involucre campanulate, glabrous outside, bearded at the throat inside ; lobes very small, ovate, subfimbriate ; glands 4, transversely oval, about $\frac{1}{2\frac{1}{4}}$ in. in the greatest horizontal diameter, not cornuate, subpeltate, thick and dusky with thin and paler margins ; bracteoles glabrous ; filaments unequal, glabrous, some of the anthers exserted ; pistil exserted, stipitate, glabrous, $\frac{1}{12}$ in. long ; stipe exserted by $\frac{1}{16}$ in., recurving, glabrous, abruptly swelled at the apex below the pistil ; styles short, free to near the base, diverging ; stigmas bifid at the apex.

Pungo Andongo.—In pastures among low bushes, between Condo and Quisonde ; fl. March 1857. No. 281.

Related to *E. rosea* Retz, but differs by entire leaves, solitary flower-heads, etc.

8. **E. Benthami** Hiern, sp. n.

A slender, rigid, glaucous, glossy, erect, sparingly branched, perennial herb, 2 to 3 ft. high ; stem in the lower part hard almost woody and subterete, in the upper part slender and sparingly pubescent ; branches dichotomous, erect or ascending, slender, angular, furrowed, subpubescent towards the apex, moderately leafy ; leaves narrowly elliptical or the lower ones broader, wedge-shaped at the base, very acute or finely apiculate at the apex, membranous, somewhat pilose, distantly and delicately serrulate-denticulate on the margin with small weak

bristle-pointed or subulate teeth, 1 to 3 in. long by $\frac{1}{4}$ to $\frac{3}{4}$ in. broad, alternate or the upper ones usually opposite; petioles slender, somewhat pilose, $\frac{1}{6}$ to $\frac{2}{3}$ in. long; stipules short, often much reduced; inflorescence subsessile, axillary and terminal, and often terminating very short axillary branchlets, not opposite, monocephalous; involucre campanulate-turbinate in fruit, nearly $\frac{1}{8}$ in. long, woolly outside; lobes small, ovate, fringed; glands transversely oval, thickly substipitate, about $\frac{1}{30}$ in. in horizontal length, not appendaged; bracteoles shorter than the filaments, pilose; capsules very shortly and thickly stipitate, hirsute, $\frac{1}{6}$ to $\frac{1}{5}$ in. long; seeds smooth, minutely punctate; styles free to the base at the apex of the fruit.

Huilla.—In wooded meadows between Lopollo and Ivantâla, rather sparingly; fr. Feb. 1860. No. **283**.

Related to *E. agowensis* Hochst. (Benth. ms. in herb. Kew).

9. **E. decussata** E. Mey. in Drege Zwei Pflanzengeogr. Doc. pp. 67, 184 (1843); Boiss. in DC., *l.c.*, p. 74.

Arthrothamnus cymosus Kl. & Garcke in Klotzch, Linn. Nat. Pflanzenkl. Tricocc. in Monatsber. Akad. Wissensch. Berlin, March 1859, p. 251; and in Abh. Akad. Wissensch. Berlin, 1860, p. 63.

Mossamedes.—Frutescent, 3 to 4 ft. high, much branched from the base, dichotomous or trichotomous, glaucous, fleshy, rigid, with the habit of *Sarcostemma*; branches ascending, articulate; the ultimate joints flowering, abbreviated, after the fashion of *Salicornia*; flowers sessile, yellowish. On the somewhat saline rocky declivities of Serra de Montes Negros, distant a (German) mile from the sea-coast, plentiful; fl. 10 Aug. 1859. No. **632**.

This determination is doubtful.

10. **E. viminalis** Burm. f. Fl. Cap. Prodr. p. 14 (1768); non L. *E. Burmanni* E. Mey., *l.c.*, pp. 102, 184; Boiss. in DC., *l.c.*, p. 75.

Mossamedes.—The whole plant glaucous, rigid, brittle. On the calcareous saline interior declivities of Serra de Montes Negros, rare; young plants, without fl., Aug. 1859. No. **631**.

Welwitsch thought that this was a young form of his No. **632** (*E. decussata* E. Mey.). This determination is very doubtful; perhaps the variety *karroensis* Boiss, *l.c.*, that is, *Arthrothamnus Burmanni* Kl. & Garcke, *ll.cc.*, pp. 251, 62, represents our plant; or possibly *E. serpiformis* Boiss. in DC., *l.c.* *E. viminalis* L. is an Asclepiad.

11. **E. grandifolia** Haw. Syn. Plant. Succul. p. 130 (1812).

E. drupifera Thonning in Danske Vidensk. Selsk. iv. p. 24 (1829); Boiss. in DC., *l.c.*, p. 80.

Island of St. Thomas.—A tree, 8 to 20 ft. high. Cultivated on the coast and in the mountainous parts of the island; leaves only, Dec. 1860. "Pago olho de Macação." No. **645**.

Prince's Island.—A tree, 25 ft. high; trunk 1 to $1\frac{1}{2}$ ft. in diameter. In the elevated forests by rocks, S. de Papagaio; one leaf only, Sept. 1853. No. **645***b*.

I have not seen the type of either Haworth's or Thonning's species;

and our specimens, consisting only of foliage, are insufficient for certain determination; they should also be compared with *E. Teke* Schweinf. ex Pax in Engl. Bot. Jahrb. xix. p. 118 (1894).

The following No., which is without flowers, should be compared with this species, though it is apparently distinct; the prickles are straight, in pairs, distinct at the base, diverging, $\frac{1}{12}$ to $\frac{1}{8}$ in. long; and the leaves are obovate and entire, and measure $3\frac{1}{2}$ to 4 in. long by $1\frac{3}{4}$ to 2 in. broad; it is referred to by Welwitsch, Apontam. p. 564 under n. 153; it should also be compared with a specimen in the Kew herbarium, collected near Regent by G. F. Scott Elliot, Sierra Leone Boundary Commission, n. 4112:—

Pungo Andongo.—A small tree, 10 to 12 ft. high, a beautiful plant resembling *E. neriifolia* L.; trunk 3 to 4 in. in diameter, divided at the top into crowded ascending or spreading branches, which are angular, thick and leafy towards the apex; leaves obovate-lingulate, fleshy, glaucescent. In small open woods, on a sandy soil, at the bank of the river Cuanza, near Candumba, rather rare; without fl. March 1857. No. **644**.

12. **E. opuntioides** Welw. ms. in herb.

Shrubby, glabrous or nearly so; stem low, branched at the base; branches ascending or decumbent, fleshy-woody, flattened-compressed, articulate, glaucous-green, about 6 in. long, leafless, remarkably resembling an *Opuntia*, $\frac{2}{5}$ to $\frac{3}{5}$ in. broad at the constrictions; joints 1 to $1\frac{1}{2}$ in. broad and long, sub-circular or broadly obovate in general outline, undulate, coarsely crenate or repand on the darker sparingly spiny margin; spines rather slender, dusky, seated at the apex of the undulations or crenations, usually in pairs, distinct at the base, erect or diverging, straight or a little curved, deciduous, $\frac{1}{8}$ to $\frac{1}{6}$ in. long; cymes short, inserted in the shallow depressions at the apex of the subtruncate terminal joint of the branches, erect, 3- to 1-headed; common peduncle thick, $\frac{1}{8}$ to $\frac{1}{6}$ in. long, with two opposite broadly ovate obtuse or rounded bracts at the apex, secondary peduncles thick, the lateral ones $\frac{1}{8}$ to $\frac{1}{6}$ in. long divergent, the middle one shorter; middle involucre sub-hemispherical, somewhat compressed, $\frac{1}{6}$ in. broad, bibracteate at the base; lateral involucres rather smaller, about $\frac{1}{8}$ in. broad; the bracts broadly ovate or semicircular, nearly equalling the involucre in height, concave, adpressed; lobes of the involucre short, fringed at the apex; glands very short, broad, crenulate on the margin; bracteoles among the filaments fringed at the apex; pistil sessile or very nearly so, glabrous; styles united one-third way up from the base, diverging above, shortly cleft at the apex; ripe carpels about $\frac{1}{4}$ in. long; seeds $\frac{1}{6}$ in. long, smooth.

Pungo Andongo.—By rocks in black sandy schist, close to the banks of the river Cuanza, near Candumba, not uncommon but rather sparse; fl. and fr. Jan. to March 1857. No. **638**.

13. **E. bellica** Hiern, sp. n.

A robust, green-glaucous, spiny, glabrous, leafless, succulent shrub, 3 to 5 ft. high, copiously milky, affording resin; trunk a

little angular, branched from the base; branches decumbent, ascending, crowded, articulated-constricted; branchlets $\frac{3}{8}$ to $\frac{1}{2}$ in. thick at the constrictions; spines strong, straight, ranging up to $\frac{3}{4}$ in. long, diverging in pairs arising from elevations along the angles of the branches, the apices of the elevations about $\frac{1}{2}$ in. distant from each other on each angle, the bases broad and confluent; joints $1\frac{1}{4}$ to $1\frac{3}{4}$ in. long, the angles few, produced into fleshy compressed wings; wings thick, semicircular or semi-elliptical, sinuous-dentate on the margin, spreading to a distance of $\frac{1}{2}$ to $\frac{3}{4}$ in. from the axis of the branchlet; teeth 3 to 5, broad, obtuse, shortly or obsoletely spiny at the apex; the youngest branchlets very glaucous.

Mossamedes.—In sandy hilly maritime places, from the river Giraûl to Cabo negro, very plentiful, not uncommonly occupying almost exclusively extensive tracts of country; with few fl. July 1859. The bulk of the specimens collected were lost in the war with the Munanos, and only rudimentary pieces remain. No. **643**.

This belongs to the section Diacanthium, and apparently is related to *E. Lemaireana* Boiss. and *E. antiquorum* L.; it is perhaps the succulent Euphorbia which frequently forms the matrix of *Hydnora africana* Thunb. (Welw. herb. n. 530) and is ultimately killed by it. This also is probably the cactus-like *Euphorbia*, occurring to the south of the town of Mossamedes in July 1859, which was beset with the rare fungus n. 147, *Tulostoma angolense* Welw. & Currey in Trans. Linn. Soc. xxvi. p. 290, t. 20, figs. 10 and 11 (1868); also the decumbent *Euphorbia* which bore Lichen n. 420, *Roccella linearis* var. *primaria* Wain (see Welw. in Journ. Linn. Soc. v. p. 183), together with species of *Ramulina* (cf. Lichen n. 23) in July 1859 near the town of Mossamedes; also in the midst of which grew *Emilia albocostata*, *ante* p. 596, Welw. herb. no. 3573. It must also be compared with *E. triangularis* Desfont. Cat. Fl. Hort. Paris., edit. 3, p. 339 (1829), name only, a plant supposed to belong to the Cape Flora.

14. **E. polyacantha** Boiss. Cent. Euphorb. p. 25 (1860), and in DC., *l.c.*, p. 84.

Pungo Andongo.—A fleshy, tenacious shrublet, 1 to $1\frac{1}{2}$ ft. high; prostrate-ascending or the stems at first erect, soon becoming decumbent, 3- to 6-angled, articulate-moniliform, glaucous-green, leafless, the younger ones 2- to 4-angled; branches erect-spreading, 4- to 6-angled; the angles spiny-toothed; the whole plant abounding in a caustic milk; flowers yellow. On the gneiss rocks of the Pedras Negras in the præsidium, chiefly on their very dry slopes, in company with species of *Xerophyta* (cf. *X. squarrosa* Baker; Welw. herb. 1555 and Coll. Carp. n. 1006), Commelinaceæ, etc., plentiful; fl. Jan. and Feb. 1857; also a young plant near Catete, Feb. 1857. No. **639**.

Huilla.—A shrublet, 7 in. high or less, articulately branched from the base, in form resembling an *Opuntia*; flowers yellowish. On mica-schist rocks, among bushes, at an elevation of 5000 ft., between Lopollo and Nene, sparingly; very few specimens in fl. Feb. 1860. No. **640**.

15. **E. Candelabrum** Welw. in Annães Conselho Ultramarino Lisb. no. 24 (May 1856), p. 251, n. 5.

E. candelabra Welw. in Proc. Linn. Soc. ii. p. 329 (7 Nov. 1854), name only.

Loanda.—A tree, 15 to 45 ft. high, and more, in the form of a candelabrum, constituting dense forests in dry, hilly, maritime, and rocky places, but sometimes solitary; trunk straight, 1 to 2½ ft. in diameter; bark cracked; branches subverticillate, ascending-arching; branchlets verticillate; trunk and branches 3- to 8-angled; branchlets mostly trigonous; flowers red, very crowded, as well as the whole plant much abounding in milk. Plentiful; fl. July and Aug. 1858. Around Cacuaco, where it grew in company with *Lissochilus calopterus* Reichenb. f., it was usually more than 50 ft. high, with a stem 2½ ft. in diameter; beginning of Jan. 1854; near Mutollo, 23 July 1854; Loanda, 17 June 1858. A characteristic tree, producing a very fine effect. No. **641**.

Stakes cut from this tree and planted easily take root and grow quickly; they are thus used by the negroes for making fences around their dwellings.

The lichens n. 211, *Tremotylium angolense* Nyl., n. 164, *Lecidea episemoides* Nyl., and n. 399 (?) *Opegraphia graphidiza* Nyl., also n. 189, grew on the old trunks of this tree: see Nylander, Lich. Angol. Welw. pp. 8, 10, 12 (1869); lichen nn. 320, 414, 413, 399, 398, 328, and 350 at Boa Vista. *Barleria salicifolia* S. Moore, Welw. herb. no. 5119, grew in little woods composed of *Euphorbia*, probably this species, about Libongo.

It is doubtful whether this is the same species as *E. Candelabrum* Tremeau ex Kotschy, Allgem. Ueberbl. Nilländ. p. 13 (1857) in Mitth. Geograph. Gesellsch. Wien., Jahrg. i. Heft ii. p. 169; Kotschy, Umr. Uferl. Weiss. Nil, p. 23 (1858) in Mitth., *l.c.*, Jahrg. ii. Heft i. p. 92; Boiss. in DC., *l.c.*, p. 84; Petherick, Trav. Centr. Afr. i. p. 308 (1869). It is probably the gigantic *Euphorbia* mentioned by Welwitsch in Proceed. Linn. Soc. ii. p. 328 (1854) as forming woods at Loanda, just as *Pinus sylvestris* does with us, and readily discernible even from shipboard.

The following Nos. perhaps belong to this species of Welwitsch:—

Pungo Andongo.—A little tree 10 to 12 ft. high, or rarely 15 ft.; trunk straight, subcylindrical, 3 to 4 in. in diameter, hard-woody, spiny-tuberculate; branches and branchlets spreading-ascending, 3- or rarely 4-winged, glaucous-greenish, leafless. By rocks near Mangue and Candumba, plentiful; without fl. March 1857. No. **641***b*. A tree of 12 to 15 ft., candelabriform, with acutely trigonous ascending branches and branchlets. By schist rocks in wooded places near Mangue on the road leading to Candumba; without fl. March 1857. No. **637**.

Bumbo.—A tree, 20 to 40 ft. high; trunk straight, cylindrical, much branched towards the apex, with the bark cracked as in *Picea*; branches suberect, as well as the branchlets triquetrous and glaucous; spines purple, venomous or certainly suspected. In the rather dense rocky primitive forests of Serra de Xella; without fl. June 1860. Only one specimen. No. **636**.

Golungo Alto.—Arborescent. At Bango; fl. only 7 and 8 Sept. 1855. Local name "Quisoma." Coll. Carp. 932.

"Insomma" is the name of an arborescent *Euphorbia*, which grew on the banks of the Zenga, and is probably another form of the name "Quisoma." A tree *Euphorbia*, to which Welwitsch referred by the name of "Quisoma" in his diary of 6 Sept. 1857, occurred at Funda in the district of Icolo e Bengo. It occurred also in the Libongo district in company with *Acacia Welwitschii* Oliv., *ante*, p. 310.

16. **E. subsalsa** Hiern, sp. n.

A fleshy, very prickly, leafless, very copiously milky shrub, attaining 2 to 4 ft. in height, beginning to flower when only 7 or 8 in. high, slightly puberulous, subglaucous, pale green, with the habit of a *Cereus*; branches tetragonal, quadricostate, subvirgate, furrowed between the angles; ribs undulate, pulvinate; prickles about 4 together, distinct, straight, unequal, patent, subdivergent, acute, rather slender, $\frac{1}{4}$ to $\frac{1}{2}$ in. long; branchlets brachiate, somewhat constricted at the base, distant, ascending, $1\frac{1}{2}$ to 3 in. long, about $\frac{1}{4}$ in. broad, frequently marked with circular shallow scars (of fallen flower-heads) on the angles above the raised bases of the collections of prickles; cymes subterminal or lateral, small, sessile, solitary or in pairs, bracteate at the base; bracts broadly oval, the inner pair $\frac{1}{10}$ in. long, the outer bracts very short; flowers yellowish, sessile; involucre nearly $\frac{1}{8}$ in. long, campanulate, truncate at the apex; lobes 5, short, about $\frac{1}{15}$ in. broad, shortly bifid, membranous, subtruncate and fringed at the apex; glands transversely oblong, short, equalling or slightly exceeding the involucral lobes and thicker, $\frac{1}{16}$ in. broad, entire; bracteoles between the filaments fringed at the obtuse apex, nearly as long as the involucre, obovate; capsule very shortly stipitate, $\frac{1}{8}$ in. long, shortly exserted, glabrous; styles 3, united up to a third of their length, entire at the apex.

Mossamedes.—Seen only at Pedra de Sal, between Mossamedes and Bumbo, not far from a salt spring (Marne), near the river Maiombo; a few specimens, fl. Oct. 1859. No. 642.

Related to *E. triaculeata* Forsk. and to *E. tetracantha* Rendle in Journ. Bot. 1896, p. 130. The local name is "Hâhi."

17. **E. subfalcata** Hiern, sp. n.

A subglabrous, glaucescent, perennial herb, 2 to 4 in. high; root very large, more or less napiform or fusiform, milky, with white flesh; stem ascending, subcylindrical, $\frac{1}{8}$ to $\frac{1}{4}$ in. thick, branched towards the top; persistent bases of the fallen stem-leaves ovoid or ovate, scattered, scarcely prominent; branches short, leafy, spreading or recurving; their leaves narrowly lanceolate-linear, prolonged, acute, sub-falcate, ranging up to 2 in. long or rather more, rather fleshy, sessile, entire, crowded; the floral leaves opposite, exceeding the inflorescence, induplicate about the base; stipules 0; flower-heads solitary, on short rather thick fleshy stalks; flowers white-greenish; involucre broadly turbinate, its tube somewhat hairy inside, $\frac{1}{12}$ to $\frac{1}{10}$ in. long; lobes roundish, somewhat hairy, ciliate-fringed, $\frac{1}{20}$ to $\frac{1}{16}$ in. broad; glands 4, unequally bilabiate; the inner lip very short, broad, minutely crenulate, hairy inside; the outer lip about $\frac{1}{6}$ in. long, from a broad base multisect, the segments once or twice or thrice cleft, the ultimate lobes spreading; bracteoles among the unequal fewer nearly glabrous filaments narrow, thickened at the apex, hairy; anthers glabrous; capsule tricoccous, shortly exserted, stipitate, $\frac{1}{8}$ to $\frac{1}{6}$ in. long, $\frac{1}{4}$ in. broad, tough, sub-crustaceous, emarginate at the apex, glabrous or nearly so; stipe puberulous;

styles united about half-way up, bifid at the apex; seeds pallid, smooth, minutely pulverulent-punctulate.

Huilla.—In rather elevated hilly places, on sand mixed with a rich soil, in company with *Ascolepis*, etc., near Lopollo towards Nene; fl. and fr., end of Oct. and beginning of Nov. 1859. No. **282**.

Related to *E. tuberculata* Jacq.

18. The following No., which has some resemblance to *E. cervicornis* Boiss., Cent. Euphorb. p. 27 (1860), and in DC., *l.c.*, p. 90, is perhaps a new species:—

A puberulous, much-branched shrublet, 3 to 4 in. high, 4 to 6 in. in diameter; stems cæspitose, about $\frac{1}{2}$ in. thick at the base, repeatedly branched; branches dichotomous, subterete, spreading in all directions, fleshy, intricate, glaucescent, leafless, marked with scars as of fallen leaves, some recurving; scars alternate, usually with an elevation, rather small, not approximate; inflorescence terminal; heads on peduncles which range up to $\frac{1}{6}$ in. long; involucre about $\frac{1}{6}$ in. in diameter, puberulous; bracteoles among the filaments filiform, hairy; pistil at length shortly exserted.

Mossamedes.—In rocky maritime places at Praia da Amelia, near Mossamedes, sparingly, or perhaps mostly perished; in late fr. with but few capsules left (no fruits in the British Museum set) July 1859. No. **635**.

19. **E. Tirucalli** L. Sp. Pl. edit. 1, p. 452 (1753); Boiss. in DC., *l.c.*, p. 96; Ficalho, Pl. Uteis, p. 248 (1884).

E. rhipsaloides Welw. in Annaes Conselho Ultramarino Lisb. no. 24 (May 1856), p. 252. n. 11. Cf. *E. rhipsalioides* Lemaire, Ill. Hort. 1857, misc. p. 72.

Among plants of this species *Gossypium* grew near Bemposta in Loanda, at the end of July 1858.

Loanda.—A milky bush (in the denser forests of Ambriz, Icolo e Bengo, and Zenza de Golungo, a tree 15 to 20 ft. high, with the trunk 6 to 8 in. in diameter), 8 to 12 ft. high, divaricately branched, with the habit of *Hariota*; the older branches leafless, the younger ones with linear leaves; flowers yellowish. About Loanda and negro villages plentiful and ubiquitous; fl. 1853-4 and Jan. 1858. No. **630**. In fr. Dec. 1853. Coll. Carp. 917. Lichen n. 461 grew in the coast region of Loanda, in May 1854, on the older trunks of a leafless *Euphorbia*, probably this species.

Golungo Alto.—A much-branched leafless shrub. In the somewhat dry thickets of Sobato de Bumba, near Camilungo, sporadic; fl. March 1856. No. **651**.

Mossamedes.—An undershrub, 2 ft. high; root thick, horizontal; stems straight, erect-spreading, branched, not articulate; flower-buds tubercle-shaped; the whole plant in the living state yellowish green, glaucous, smooth. At the red-sand rocks close to Rio do Sal, at the base of Serra de Montes Negros, in front of Boca do Rio Bero; without fl. July 1859. Perhaps this species. No. **633**. A low shrub, with strict asperulous branches. Serra de Montes Negros; fr. 10 Aug. 1859. Doubtfully referred to this species. Coll. Carp. 916.

A large *Polyporus* grew on this tree near Loanda in April 1859, and on the former grew the Fungus n. 11. The tree is called "Cassoneira" at Loanda, or "Canumi-numi," and is used for making fences and

hedges around the quintas and arimos, since it grows rapidly and has numerous virgate intricate and almost leafless branches. Lichen n. 321 in Sobato Quilombo grew on the bark of a *Euphorbia*, perhaps this species.

20. **E. acalyphoïdes** Hochst. in Pl. Kotschy Nubic. n. 88 (*U.i.*, 1841); Boiss. Icon. Euphorb. p. 17. t. 49 (1866), and in DC., *l.c.*, p. 98.

Tithymalus acalyphoides Schweinf. Beitr. Fl. Æthiop. p. 38 (1867).

Loanda.—In stony herbaceous places at Porta da Isabella near Loanda; fl. and fr. Dec. 1853 and April 1854. In hot sandy places in short grass and by thickets near Penedo, plentiful; fl. and fr. beginning of Dec. 1857. No. **296**.

21. **E. sarmentosa** Welw. ex Pax in Engl. Bot. Jahrb. xix. p. 121 (1894).

Loanda.—Perennial, suffruticose, woody at the base; stem smooth, becoming reddish, sub-erect, dichotomous, much-branched, 6 to 8 in. in diameter at the base, branches spreading, elongate-virgate, tortuously sarmentose, adpressedly hirsute; branchlets patent-recurved; leaves lanceolate-linear or linear, shortly petiolate, soft, somewhat fleshy, glaucescent; flowers secund on the branchlets, solitary in the axils of the leaves, shortly pedunculate; involucre 4-cleft; the segments reddish brown, truncate, subcrenulate; germen ellipsoidal, as well as the capsule adpressedly hirsute. In dry bushy hilly places on sandy clay around Quicuxe rather rare, very rare near Loanda, one specimen at Barrancos de Penedo; fl. and fr. middle of July 1858. In hilly rather elevated places between Quicuxe and Mutollo, April 1854, among tall grasses, near Mutollo, end of May 1854. No. **297**. Stems and leaves fleshy, full of milk; stems at first erect, at length ending in tortuous subscandent almost leafless branchlets; leaves linear. In mountain thickets at Mutollo; fr. April 1854. Coll. Carp. 913. An undershrub with a peculiar habit for the genus; branches elongated, sarmentose, subscandent. On bushy hills near Loanda, rather rare; fr. July 1858. Coll. Carp. 915.

It has much the aspect of *E. systyla* Edgew.

22. **E. Tukeyana** Steud. Nomencl. Bot., edit. 2, i. p. 615 (1840).

E. arborescens Chr. Sm. in Tuckey, Congo, p. 251 (1818), non alior. *E. Tuckeyana* Webb in Hook. Niger Fl. p. 177 (1849); J. A. Schmidt, Fl. Cap Verd. Ins. p. 304 (1852); Boiss. in DC., *l.c.*, p. 109; Ficalho, Pl. Uteis, p. 249 (1884).

Cape de Verde Islands.—A stout shrub, 4 to 7 ft. high. In the more elevated bushy mountainous parts of Monte Verde in the island of St. Vincent, plentiful and growing in masses; fl. and fr. Aug. 1853. Called by the inhabitants "Tira olhos." No. **646**.

According to Ficalho, *l.c.*, the shrub is also called "Tosta olho,"—that is, goggle-eye, probably in consequence of the inflammation of the eyes which the acrid sap produces. The bark affords one of the best preparations for tanning hides.

23. **E. claytonioides** Pax in Engl. Bot. Jahrb. xxiii. p. 533 (1897).

Mossamedes.—An ascending glaucous somewhat fleshy herb, very milky throughout, annual or lasting for several years; stem patently branched a little above the base; umbellules dichotomously multifid.

On the rocky declivities of Serra de Montes Negros; fl. and fr. July 1859. By the red-sand rocks close to the base of Serra de Montes Negros; fl. and fr., 10 and 13 Aug. 1859. **No. 287.**

24. **E. cyparissioides** Pax in Eng. Bot. Jahrb. xix. p. 123 (1894).

Suffruticose, woody, decumbent, and thick at the base, subglaucescent, glabrous, heath-like; rootstock woody, perennial, giving off numerous stems or branches, resembling in habit *E. Cyparissias* L.; stems erect or ascending, virgate, wiry, simple for some distance, losing their leaves near the base, densely leafy above, at length dichotomously branched in the upper part and umbellate at the apex; leaves approximated, not opposite, linear or rather broadly so, subacute and mucronate at the apex, somewhat narrowed to the sessile base, more or less spreading, at length reflected, $\frac{3}{8}$ to $\frac{3}{4}$ in. long, revolute on the entire margins, those at the base of the umbels broader and lanceolate; rays of the umbels about 5, unequal; inflorescence sessile, terminal; carpels smooth, $\frac{1}{5}$ in. long; seeds smooth, pallid.

Huilla.—In rocky sandy sparingly bushy pastures, near Lopollo, not abundant; in late fr. Oct. 1859. **No. 285.**

In the absence of flowers, this determination is doubtful; the type of the species occurred at Dar Fertit, Dem Gudju, and was collected by Schweinfurth, ser. iii. n. 149.

25. **E. terracina** L. Sp. Pl. edit. 2, p. 654 (1762); Boiss. in DC., *l.c.*, p. 157.

Island of Madeira.—In rough uncultivated places between Funchal and Camara dos Lobos; fl. and fr. Aug. 1853. **No. 289.**

26. **E. balsamea** Welw. ms. in herb.

A fleshy, glabrous, very glaucous shrub, much-branched from the base, 1$\frac{1}{2}$ to 3 ft. high; sap copious, milky, agreeable when fresh and like a balsam in smell; primary stem about an inch thick; branches dichotomous, more or less ventricose at the base, about as thick as a man's finger; the young branches elongate-conical, leafy; leaves of the branches alternate, lanceolate or oval, obtuse at the apex, narrowed towards the base, entire, fleshy, glaucous, spreading, $\frac{1}{2}$ to $\frac{2}{3}$ in. long, $\frac{1}{5}$ to $\frac{1}{4}$ in. broad, falling off from the adult branches; petioles $\frac{1}{8}$ to $\frac{2}{5}$ in. long; stipules 0; leaves of the inflorescence opposite, sessile or subsessile, not connate but contiguous, very broadly ovate or oval, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, rounded or emarginate at the apex, the uppermost pairs indupli-cate and embracing the terminal solitary sessile or subsessile heads of flowers; involucres tubular-campanulate or obovoid, truncate, entire or sub-crenulate, hairy at the throat, green, $\frac{1}{8}$ in. long, veiny, easily separating into obovate-oblong segments; lobes short, bifid, fringed; glands transversely oval, not cornuate; bracteoles among the filaments hairy, equalling the involucre; anthers greenish glaucous; pollen yellow. General inflorescence lax; umbels of few rays. Ripe capsules not seen.

Mossamedes.—In hilly sandy maritime places between Mossamedes and Cabo Negro; fl. June 1859. Also in rocky hilly places thinly

covered with brown sand, near S. Antonio, plentiful; fl. fallen, 21 July 1859. No. **634**.

Nearly related to *E. Bursei* Boiss. in DC., *l.c.*, p. 167, and Icon. Euphorb. p. 23, t. 110 (1866), but it differs by the petiolate stem-leaves, hairy filaments, etc.

27. **E. genistoides** Berg. Descr. Pl. Cap. p. 146 (1767); L. Mant. alt. p. 564 (1771); Boiss. in DC., *l.c.*, p. 167.

Tithymalus Africanus, flore herbaceo, folio Genistæ, Burm. Cat. Plant. Afr. Herm. p. 23 (1737).

Pungo Andongo.—Suffruticose, heath-like, glaucescent, woody and thick at the base; rootstock woody, perennial, giving off at the apex several erect or ascending wiry rather slender puberulous or glabrate stems which are about a foot high; stems undivided and losing most of their leaves from the base to about a third of their length, loosely branched above, often umbellately branched at the top; branches leafy; leaves approximated, scattered, spreading or the lower ones reflected, linear, narrowly mucronate at the apex, sessile, rigid, minutely pulverulent or glabrate, $\frac{1}{4}$ to nearly $\frac{1}{2}$ in. long, uninerved; the lateral margins revolute, entire; stipules 0; inflorescence terminal, sessile, tripartite; the two lateral cymules shortly stalked, bibracteate at the base, small. The central cymule subsessile, ebracteate at the base, broader than the lateral ones; bracts oblong, mucronate, not connate, about $\frac{1}{8}$ in. long, exceeding the lateral cymules; involucre of the central cymule campanulate-hemispherical, $\frac{1}{8}$ in. long, somewhat compressed, minutely pulverulent outside, shortly puberulous inside; the lobes about 7, quadrate or ovate, small, ciliate-fringed at the apex; the external glands intermediate, unequally broad, transversely oval or oblong, peltately saucer-shaped, not or sometimes cornuate, about as high as the lobes, glabrous on the margin; filaments about equalling the involucre; bracteoles hairy, among the filaments and about the same length; ovary stipitate, shortly exserted, tricoccous, puberulous; styles united about half-way, the branches bifid; capsule $\frac{1}{5}$ in. long, minutely puberulous-punctate; seeds smooth. In the drier thickets between Quisonde and Condo, rather rare; fl. and fr. middle of March 1857. No. **286**.

I have not seen the type of this species; the original description gives the involucral lobes as four; the determination is therefore doubtful.

2. **BUXUS** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 266.

The following No. has the appearance of this genus, and is possibly the variety *myrtifolia* of *B. sempervirens* L. Sp. Pl. edit. 1, p. 983 (1753); being without fl. or fr. it is uncertain:—

Huilla.—A shrublet nearly glabrate or minutely, puberulous especially on the tetragonal branchlets and on the very short petioles, 1 to 3 ft. high, with the habit of a Box, glaucescent; leaves apparently evergreen, somewhat glossy, coriaceous, elliptical ovate or lanceolate, wedge-shaped at the subsessile base, more or less obtuse at the apex, $\frac{1}{2}$ to 1 in. long by $\frac{1}{8}$ to $\frac{3}{8}$ in. broad, recurving along the margin, with numerous inconspicuous veins and the midrib prominent beneath. On the rocky ridges at the top of Sierra de Xella not far from Mumpulla, about 4000 to 4100 ft. alt., Oct. 1859 and June 1860, abundant. No. **409**.

The wood is like that of the ordinary Box.

The plant should be compared with *B. benguellensis* Gilg in Engl. Bot. Jahrb. xxviii. p. 115 (15 Dec. 1899), which belongs to Huilla, but an authentic specimen of which I have not seen.

3. **BRIEDELIA** Willd. ; Benth. & Hook. f. Gen. Pl. iii. p. 267 (*Bridelia*).

In Pungo Andongo the natives give the name of "Cabalella" to two or three arborescent species of this genus.

1. **B. atroviridis** Muell. arg. in Journ. Bot. ii. p. 327 (1864), et in DC. Prodr xv. 2, p. 494 (1866) (*Bridelia*).

Cazengo.—A low tree, with very patent almost drooping branches and distichous leaves. In the primitive forests of Mata de Cabondo ; fr. June 1855. No. **370***b*.

Golungo Alto.—A small tree, 10 ft. high, almost calling to mind the coffee tree ; branches patent, almost nodding ; leaves dark, deep-green above, shaded with purple and especially on the veins reddish beneath ; flowers from greenish to reddish. In bushy places in secondary woods near Camilungo, between it and Sange, rather rare ; fl. Dec. 1855. No. **370**.

2. **B. tenuifolia** Muell. arg. in Journ. Bot., *l.c.*, p. 328, et in DC., *l.c.*, p. 495 (*Bridelia*).

Zenza de Golungo.—A much-branched shrub of 5 to 6 ft., or in secondary thickets 1½ to 2 ft. high ; berries pruinose-bluish, nearly black. On dry hills near Tanderaxique ; fl. and fr. Sept. 1854. A shrub, 2½ to 4 ft. high ; stems numerous, erect ; bark whitish grey ; sap watery ; branches and branchlets slender, patent ; leaves membranous, somewhat rigid, shining above, pallid beneath, deciduous at the time of the fruit ; drupes sessile, clustered in the axils of the leaves, blackish blue, with a viscid juice ; pyrenes 2, monospermous. In dry elevated hilly bushy places near Quicanga, very plentiful ; fl. and ripe fr. Sept. 1857. No. **374**.

Golungo Alto.—A small tree, 6 to 10 ft. high, with a much-branched head ; branches divaricate ; branchlets slender, somewhat drooping ; flowers yellow-greenish. In thickets close to the Ambaca road, between Camilungo and Cabinda ; fl. and young as well as ripe fr. March 1855. No. **373**. A shrub 3 ft. high, perhaps a mutilated tree. On the road to Ambaca ; without fl. or fr. Dec. 1855. No. **370***c*.

3. **B. angolensis** Welw. ex Muell. arg. in Journ. Bot., *l.c.*, p. 327. *Bridelia angolensis* Muell. arg. in DC., *l.c.*, p. 496.

Pungo Andongo.—A small tree, 15 to 20 ft. high ; trunk 4 to 8 in. in diameter at the base, bare to the height of 6 to 7 ft., then with crowded branches, branchlets and foliage; leaves hard-coriaceous, rigid, but little glossy, distichous ; male flowers axillary, clustered, at length by the falling of the leaves subspicate or paniculate, greenish in the bud and when young, the adult ones purplish outside and yellowish inside. In rather elevated little woods on the gigantic rocks above Catete in the præsidium, sporadic. A young shoot of a tree which had been cut down on the same spot. In fl. beginning of Jan. 1857. No. **367**.

4. **B. elegans** Muell. arg. in Journ. Bot., *l.c.*, p. 327, et in DC., *l.c.*, p. 496 (*Bridelia*).

Huilla.—A shrub, 5 ft. high and more, occasionally arborescent ; branches elongated, patent ; branchlets virgate ; leaves rigid, rather distant, with red veins beneath. In wooded thickets around Humpata ; fl. Jan. 1860. No. **361**.

Scarcely distinct from *B. scandens* Willd., from which Welwitsch

thought it could not be separated ; for he regarded his nos. 361 and 362 as the same species.

5. **B. speciosa** Muell. arg. in Journ. Bot., *l.c.*, p. 327, et in DC., *l.c.*, p. 497 (*Bridelia*).

a, **trichoclada** Muell. arg., *ll.cc.*, pp. 327, 498.

Bumbo.—A handsome tree, 25 to 40 ft. high, very frondose, distinguished with a dense widely spreading head and a luxuriant glossy foliage, one of the most beautiful ornaments of the forest ; flowers greenish with a slightly purple tinge. In the more elevated very shady forests of Serra da Xella, 15° S. Lat., Scudelbilla, plentiful, also near Bumbo ; fl. and unripe fr. Oct. 1859. No. **371**.

Welwitsch had given this specific name in manuscript accompanied with a descriptive character when he submitted his specimens to Mueller. *Trema affinis* Bl. (Welw. herb. no. 6288) grew in company with this tree near Bumbo in Oct. 1859.

6. **B. ferruginea** Benth. in Hook. Niger Fl. p. 511 (1849) (*Bridelia*).

Candelabria micrantha Hochst. in Flora 1843, i. p. 79 (7 Feb.) ; Krauss in Flora 1844, p. 427 (7 July). *Bridelia micrantha* Muell. arg. in DC., *l.c.*, p. 498, var. *a*, *ferruginea* Muell. arg., *l.c.*

Golungo Alto.—A small tree, 8 to 10 ft. high or rarely attaining 12 to 15 ft. or in secondary thickets only a shrub of 5 to 6 ft. ; head widely spreading ; branches patent or even pendulous ; branchlets distichous, prickly when bare of leaves ; shoots distichous, without prickles ; leaves coriaceous, but little glossy, distichous ; flowers yellow-greenish, densely clustered in the axils of the leaves ; berries or drupes pea-shaped, black-bluish. At the outskirts of forests and in thickets, near Trombeta, Sange, and Camilungo, plentiful ; fl. Dec. 1854-55 ; unripe fr. March 1856. No. **368**. In reed-beds as a shrub, and at the outskirts of primitive forests as a small tree in the drier places throughout the district ; fl. Jan. 1856 ; fr. April and May 1856. A form with the leaves less tomentose beneath. No. **368***b*. A divaricately-branched tree of 10 to 15 ft. or in secondary thickets usually a shrub ; branches armed with weak almost corky prickles, leaves rigid, distichous ; berries or rather drupes bluish, monopyrenous ; pyrene unilocular ; placenta central, columnar ; ovules 6 or 4, pendulous from the apex of the placenta. At the upper sides of forests among the lower hot bushy mountains of Serra de Alto Queta ; unripe fr. Feb. 1856. No. **369**.

Pungo Andongo.—A small tree, 6 to 8 ft. high, with divaricate branches. In the less dense forests, especially in the Panda forests (cf. *Berlinia* and *Brachystegia*) in company with Combretaceæ (cf. *Combretum rubiginosum* Welw. herb. no. 4369), about Pedras de Guinga ; fl. and fr. March 1857. No. **365**. In rather elevated bushy wooded places in Sobato de Bumba, near Bumba ; fl. and unripe fr. in the rainy season, March 1857. No. **366**.

Huilla.—A divaricately branched small tree, with tortuous branches and branchlets, and dusky-shaggy on the young parts. In bushy hilly places and in secondary thickets at the base of Morro de Lopollo, quite leafless and in fl. Dec. 1859. No. **372**.

Var. **gambecola**.

B. Gambecola Baill. Adansonia i. p. 79 (1860). *B. micrantha*, var. *β*, *gambicola* Muell. arg., *l.c.*

Pungo Andongo.—A small tree, 8 to 9 ft. high; trunk straight, with broad crown at the top; branches patent; branchlets ferruginous-hirsute; leaves rather rigid, scarcely coriaceous, hirsute along the veins beneath, not recurved on the margin; flowers pentamerous, greenish purple. In bushy secondary woods between the præsidium and Pedras de Guinga (north-eastern Sobato), sparingly; fl. Jan. 1857. No. **364**. A loosely branched tree, 5 to 7 ft. high, with spiny branches. At the outskirts of Mata de Pungo in the præsidium, only one little tree seen without fl. or fr. May 1857. Appears to belong here. No. **360**.

7. **B. scandens** Willd. Sp. Pl. iv. p. 979 (1806).

Clutia stipularis L. Mant. Pl. p. 127 (1767). *Cluytia scandens* Roxb. Pl. Corom. ii. p. 39. t. 173 (1798). *B. retusa* Adr. Juss. Euphorb. Tent. p. 26, t. 7, f. 22 (1824). *B. stipularis* Blume, Bijdr. Fl. Ned. Ind. p. 597 (1825); Muell. arg. in DC., *l.c.*, p. 499.

Huilla.—A shrub of 3 to 4 ft. with numerous stems, probably the upgrowth from the stock of a burnt tree. In hilly bushy places on a mica-schist formation, near Mumpulla; fl. and fr. Oct. 1859. No. **363**. A small tree or arborescent shrub, 6 to 9 ft. high, with the habit of a *Grewia*; branches divaricate; branchlets and coriaceous leaves subdistichous; flowers green-yellowish, with the general appearance of the order or of Rhamnaceæ. In sandy thickets near Lopollo and around the great lake of Ivantâla, not uncommon; fl. Jan. and Feb. 1860; fr. end of March 1860. No. **362**. A small, elegant, evergreen tree; leaves coriaceous, shining, distichous along the branchlets; drupes blackish purple, mucous. In thickets near Forte de Huilla; fr. May 1860. Coll. Carp. 34.

See note under *B. elegans*, p. 953.

4. **CLEISTANTHUS** Hook.f.; Benth. & Hook.f. Gen. Pl. iii. p. 268.

1. **C. angolensis** Welw. ex Muell. arg. in Journ. Bot. ii. p. 339 (1864), and in DC. Prodr. xv. 2, p. 505 (1866)

Kaluhaburunghos angolensis O. Kuntze, Rev. Gen. Pl. ii. p. 607 (1891).

Pungo Andongo.—A tree, 15 to 25 ft. high; head lax; leaves deciduous at the time of the flower, flowers monœcious, possibly sometimes dioecious, greenish yellow. In the less dense forests between Pungo Andongo and Luxillo; fl. and fr. Jan. 1857; near Luxillo, ripe fr. March 1857. No. **353**. A tree of 15 ft.; male flowers from greenish to yellowish. In small thin forests between Catete and Luxillo; male fl. Feb. 1857. No. **354**

The male flowers are often more abundant than the female ones.

2. **C. (?) glaucus** Hiern, sp. n.

A very nearly glabrous tree, 12 to 40 ft. high; trunk straight, bare of branches for a long distance below, 6 to 18 in. in diameter; head widely spreading, leafy; branches subterete, very slightly angular; back grey and with brown cracks; branchlets alternate, spreading or erect-patent or ascending, rather slender, obtusely angular, striate, leafy; leaves alternate, oval or broadly ovate, rounded emarginate or obtusely pointed at the apex, unequal and obtusely narrowed or sub-truncate at the base, coriaceous, very deep green above, highly glaucous beneath, very delicately

penniveined, inconspicuously reticulate, 1 to 4 in. long by $\frac{1}{2}$ to $2\frac{1}{2}$ in. broad, flat, entire; petioles rather slender, $\frac{1}{4}$ to $\frac{1}{2}$ in. long; stipules broad, short, truncate-rounded, caducous; infructescence 1 to $1\frac{1}{2}$ in. long, one or few-fruited, arising from the axils of the upper leaves; pedicels short or about $\frac{1}{5}$ in. long, slightly puberulous; fruit drupaceous, ovoid-conical, glabrous, polished, yellowish drab, $\frac{3}{4}$ in. long, $\frac{1}{2}$ in. thick, tipped with the remains of 3 styles, at the base seated on the small patelliform obtusely pentagonal residue of the calyx, trilocular; the cells monospermous; putamen almost bony; seeds $\frac{5}{16}$ in. long, $\frac{1}{6}$ in. broad, $\frac{1}{8}$ in. thick.

Pungo Andongo.—In woods among the gigantic rocks of the præsidium, near Luxillo, a tree, 12 to 15 ft. high, with the trunk 6 in. in diameter, unripe fr. middle of Dec. 1856; also near Pedras de Guinga, a tree 30 to 40 ft. high, with the trunk 18 in. in diameter, May 1857. Native name "Muriambambe." No. **1235**.

Golungo Alto.—In hilly rocky places at the base of Serra de Alto Queta, between Camilungo and Quitara; without fl. or fr. May 1855. Apparently the same species. No. **1244**.

In the absence of the male plant the genus is uncertain; it is not the "Muriambamba" or "Murianbambe" of the districts of Golungo Alto and Cazengo, which is *Coffea arabica* L.; the meaning of the name indicates that the fruit is a favourite food of antelopes.

The following No. is perhaps a new species of this genus:—

A small tree, 10 to 12 ft. high; trunk straight; head lax; branches subterete, subglabrate; branchlets alternate, erect-patent, tawny-tomentose, leafy; leaves alternate, simple, ovate-oblong, narrowed to an obtuse or scarcely acute apex, rounded and usually unequal at the base, thinly coriaceous, pilose with long scattered hairs on both faces, hirsute on the slender midrib, yellowish green (in the dried state) above, rather browner beneath, entire, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{8}$ in. broad, delicately penniveined, very delicately reticulate; petiole patent, tomentose, $\frac{1}{8}$ to $\frac{1}{6}$ in. long; stipules apparently minute and very caducous; fruit apparently solitary, axillary; peduncle tomentose, about $\frac{1}{4}$ in. long; unripe fruit subglobose, glabrous, shining, pallid or somewhat chestnut-coloured, about $\frac{2}{3}$ in. in diameter, 3-celled, tricoccous (?), superior, marked at the apex with the scars or marks of 3 styles, supported at the base on a subpersistent 5(?)-partite calyx; calyx-segments lanceolate, about $\frac{1}{6}$ in. long, hairy on the back. Seeds imperfect in our specimen.

Huilla.—In the forests of Morro de Lopollo, at an elevation about 5500 feet; without fl. with unripe fr. Jan. 1860. No. **1252**.

5. **CLUYTIANDRA** Muell. arg.; Benth. & Hook. f. Gen. Pl. iii. p. 272.

1. **C. trichopoda** Muell. arg. in Journ. Bot. ii. p. 328 (1864), and in DC. Prodr. xv. 2, p. 225 (1866).

Golungo Alto. — A herb, almost suffruticose, 4 to 11 in. high; rootstock woody, polycephalous; stems numerous; leaves glaucescent. On rather dry sparingly herbaceous mountain slopes between Calôlo and Muria, rather rare; fl. and fr. Sept. 1854. No. **327**.

6. **PHYLLANTHUS** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 272.

"Quilendûla," pl. "Ilendula," is said to be an annual climbing species of this genus, the leaves of which, mixed with "Dilŏa" (a kind of ferruginous river mud), the natives of Angola and Benguella employ as a black dye; they boil in the mixture the cloth articles which they wish to dye black (Welw. ms.). Compare "Malôa," *ante*, p. 378.

1. **P. pentandrus** Schum. & Thonn. in Danske Vid. Selsk. iv. p. 193 (1829) (*Phylanthus*).

Diasperus pentandrus O. Kuntze, Rev. Gen. Pl. ii. p. 600 (1891). *P. p.*, δ, *genuinus* Muell. arg. in DC. Prodr. xv. 2, p. 337 (1866). P. foliis Lini, Hornemann, Ind. Pl. Guin. Obs. p. 25 (1819). *P. scoparius* Welw. Apontam. p. 591, n. 110 (1859).

Loanda.—In hot sandy places in short grass near Imbondeiro dos Lobos, rather rare ; fl. and fr. Jan. and Feb. 1858. No. **324**.

Pungo Andongo.—In sandy bushy places between Condo and Quisonde, sporadic ; fl. and fr. March 1857. No. **322**. In sandy places close to the river Lombe near Lombe ; fl. and fr. March 1857. No. **323**. An annual, erect or suberect, slender herb, 1 to 2 ft. high, branched like a broom; leaves oblong-linear, subglaucescent. In sandy places at the river Cuanza; fl. and fr. March 1857. Coll. Carp. 920.

2. **P. capillaris** Schum. & Thonn., *l.c.*, p. 191 (*Phylanthus*).

β, **genuinus** Muell. arg., *l.c.*, p. 338.

P. elegans pedicellis capillaribus pendulis, Hornemann, *l.c.*, p. 25. *Diasperus capillaris* O. Kuntze, *l.c.*, p. 598.

Golungo Alto.—A prettily green undershrub, 1½ to 4 ft. high, with greenish flowers on capillary peduncles. At the outskirts of thickets in moist spots, in an excursion to Fonte de Capopa, not plentiful, fl. and fr. Dec. 1854 ; in wooded moist places about thickets, near Sange, fl. and fr. Dec. 1854 ; also by secondary thickets and at the edges of palm groves, near Bango, fl. and fr. May 1855. No. **336**.

3. **P. angolensis** Muell. arg. in Journ. Bot. ii. p. 329 (1864), and in DC., *l.c.*, p. 339.

Diasperus angolensis O. Kuntze, *l.c.*

Huilla.—In pastures rather dry but flooded in the rainy summer season, among low bushes, between Lopollo and Ferrão da Sola, sparingly ; fl. and fr., Dec. 1859. No. **332**. An annual, slender, erectly branched, subglaucous herb, 6 to 8 in. high. In hot wooded places near Lopollo ; fr. Feb. 1860. Coll. Carp. 921.

4. **P. loandensis** Welw. ex Muell. arg. in Journ. Bot., *l.c.*, p. 329, and in DC., *l.c.*, p. 342.

Diasperus loandensis O. Kuntze, *l.c.*, p. 599.

Loanda.—An undershrub, woody at the base ; stem erect, 2 to 3 ft. high, branched ; branches virgate, elongated, very slender, erect-spreading. In hilly bushy places on a clay soil behind Penedo, sparingly and seen nowhere else ; fl. and fr. April to June 1858. No. **335**.

5. **P. floribundus** Muell. arg. in Linnæa, xxxii. p. 14 (1863), and in DC., *l.c.*, p. 343 ; non H. B. & K.

Kirganelia (Anisonema) *floribunda* Baill. Adansonia i. p. 83 (1860). *Diasperus Muellerianus* O. Kuntze, *l.c.*, p. 597.

Golungo Alto.—A shrub, much branched from the base, 4 to 7 ft. high; stipules at length hardened into recurved prickles; flowers somewhat rosy. In but little damp thickets near Bango Aquitamba, fl. beginning of Nov. 1855; in secondary thickets near Sange and Bango, not uncommon, fr. Dec. 1855. No. **319**. A shrub, 6 ft. high, branched from the base; stems purplish, spinulose. In moist thickets at the rivulet Delamboa; fl. beginning of Dec. 1855. No. **318**.

Ambaca.—A shrublet, 3 to 4 ft. high, leafless at the time of the young inflorescence; stipules in the form of hooked-reflected prickles; flowers reddish. In bushy places by a dried-up stream near Hâlo on the Ambaca road; young fl. end of Sept. and beginning of Oct. 1856. No. **320**.

Pungo Andongo.—In female fl. Found with No. 317 (*P. odontadenius* Muell. arg.) in herb. Welw. No. **317***b*.

6. **P. reticulatus** Poir. in Lam. Encycl. Méth. v. p. 298 (1804) (*reticulata*).

Diasperus reticulatus O. Kuntze, *l.c.*, p. 600.

a. **genuinus** Muell. arg. in DC., *l.c.*, p. 344.

Loanda.—An erect, much-branched shrub, as tall as a man; leaflets rather large and tomentose; flowers bracteolate; fruit depressedly hemispherical, almost baccate, soft, blackish purple or rather turning black. In thickets by ponds, rather rare and in very few spots, near Imbondeiro dos Lobos; fl. and fr. 8 June 1858. No. **325**.

Benguella.—In bushy places flooded in summer, between Benguella and the Cotumbella river; fl. and fr. June 1859. No. **326**.

β. **glaber** Muell. arg., *l.c.*, p. 345.

Loanda.—A much-branched undershrub, 3 to 5 ft. high. By water reservoirs near Imbondeiro dos Lobos; fl. and fr. May and Aug. 1854. No. **325***b*.

The species of *Phyllanthus*, referred to by Welwitsch in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 250, n. 132, as an evergreen shrub 6 to 7 ft. high, with the habit of a *Buxus* and with somewhat sweet blue-black berries eaten by the negroes, and as occurring at the banks of the river Bengo in May 1854, perhaps belongs here.

7. **P. purpureus** Muell. arg. in Journ. Bot., *l.c.*, p. 329, and in DC., *l.c.*, p. 349.

Diasperus purpureus O. Kuntze, *l.c.*, p. 600.

Mossamedes.—A shrub, 5 to 6 ft. high, bright purple on the main stems and branches; stems numerous, straight; branches slender; flowers yellow. In gravelly places and in the bed of the river Maiombo then dried up near Pedra de El Rei; fl. and fr. Oct. 1859. No. **329**.

8. **P. Welwitschianus** Muell. arg. in Journ. Bot., *l.c.*, p. 330, and in DC., *l.c.*, p. 351.

Diasperus Welwitschianus O. Kuntze, *l.c.*, p. 601.

Pungo Andongo.—A lovely, erect, virgate shrublet, with glaucous foliage. In bushy pastures on a clay subsoil, between Quitage and Bumba; by no means plentiful; fl. and fr. March 1857. No. **330**.

Huilla.—A shrublet, scarcely a foot high or sometimes about 20 in.; rootstock thick; stems several, erect or ascending, purple; leaves oval or broadly elliptical, glaucescent, subsessile; flowers dicœcious, greenish; styles connate in a little tube; stigmas bilobate. In rocky places, on a clay soil, near Lopollo, in Morro de Monino, by no means plentiful; fl. and fr. April 1860. No. **331**.

9. **P. Microdendron** Welw. ex Muell. arg. in Journ. Bot., *l.c.*, p. 330, and in DC., *l.c.*, p. 359.

Diasperus Microdendron O. Kuntze, *l.c.*, p. 600.

Huilla.—Distinguishable from its allies by the habit somewhat like a little tree and by its usually larger flowers and fruits. In moist hilly places among low bushes, between Nene and Lopollo; rather rare; fl. and fr. Feb. 1860. No. **334**.

10. **P. virgulatus** Muell. arg. in Journ. Bot., *l.c.*, p. 330, and in DC., *l.c.*, p. 360.

Diasperus virgulatus O. Kuntze, *l.c.*, p. 601.

Pungo Andongo.—Dicœcious. In thickets on a sandy clay soil, between Bumba and Condo, near the great cataract of the river Cuanza; fl. and fr. March 1857. No. **328**.

11. **P. prostratus** Welw. ex Muell. arg. in Journ. Bot., *l.c.*, p. 330, and in DC., *l.c.*, p. 361.

Diasperus prostratus O. Kuntze, *l.c.*, p. 600.

Huilla.—A perennial herb or shrublet; rootstock thick; the numerous stems and branches prostrate or prostrate-ascending, not milky, with the habit of a *Polygonum*; leaves glaucescent; flowers from whitish to rosy or turning quite red; fruit capsular. In elevated pastures on sandy clay, Empalanca in the Lopollo country; apparently rather rare; fl. and fr. beginning of Feb. and 21 March 1860. No. **333**. A prostrate, glaucescent, perennial herb, with many stems and white-purple flowers. In hilly sandy parts of Humpata, above 5000 ft. alt.; fr. 21 March 1860. Coll. Carp. 77.

12. **P. maderaspatensis** L. Sp. Pl., edit. 1, p. 982 (1753).

Diasperus maderaspatensis O. Kuntze, *l.c.*, p. 600.

Var. **Thonningii** Muell. arg. in DC., *l.c.*, p. 362.

Loanda.—Annual and biennial. In moist sparingly bushy grassy places, flooded in summer, near Imbondeiro dos Lobos; fl. and fr. June 1858; also at Represa de Manuel Pereira van Huñen; fl. and fr. 16 July 1854. No. **321**. Annual. Quicuxe; fr. May 1854. Determination very doubtful. Coll. Carp. 918.

13. **P. odontadenius** Muell. arg. in Journ. Bot., *l.c.*, p. 331, and in DC., *l.c.*, p. 365.

Diasperus odontadenius O. Kuntze, *l.c.*, p. 600.

Pungo Andongo.—In damp sandy sparingly bushy places on the Calemba island in the river Cuanza, near Condo; rather scarce; in beds of *Scirpus* or such-like plants; fl. and fr. March 1857. No. **317**.

14. **P. benguelensis** Muell. arg. in Journ. Bot., *l.c.*, p. 331, and in DC., *l.c.*, p. 365.

Diasperus benguelensis O. Kuntze, *l.c.*, p. 598.

Pungo Andongo.—An annual, erect, very slender herb. In sandy bushy places at the banks of the river Cuanza, near Candumba; fl. and fr. March 1857. No. **315***b*.

Bumbo.—In fields where *Arachis hypogæa* L. had been cultivated, tolerably abundant; fl. and fr. June 1860. No. **315**.

15. **P. arvensis** Muell. arg. in Journ. Bot., *l.c.*, p. 332, and in DC., *l.c.*, p. 405.

Diasperus arvensis O. Kuntze, *l.c.*, p. 598.

Huilla.—In fields cultivated with vegetables, near Lopollo; fl. beginning of Jan. 1860. Only one specimen in herb. No. **313**.

16. **P. Niruri** L. Sp. Pl., edit. 1, p. 981 (1753); Muell. arg. in DC., *l.c.*, p. 406.

Diasperus Niruri O. Kuntze, *l.c.*, p. 600.

β. **genuinus** Muell. arg. in DC., *l.c.*, p. 406.

Loanda.—By dried-up swamps near Quicuxe, middle of July 1854. At Maiango do Rei, 30 July 1854. An annual herb; stem erect or ascending, much branched; leaves glaucescent-green; flowers small, from greenish to yellowish; here and there in masses, in moist sandy places and under the shade of shrubs, near Boa Vista and towards Teba, fl. and fr. Dec. 1858. No. **314**. A glaucous-green, leafy, annual herb, a foot high. By dried-up swamps near Quicuxe; fr. July 1854. Coll. Carp. 919.

Golungo Alto.—In fields planted with *Arachis hypogæa* L., near Sange; fl. and fr. Feb. 1855. No. **310**. In kitchen gardens near Bango-Aquitamba; fl. and fr. Dec. 1855. No. **311**. At the margins of fields near Undelle; fl. and fr. Jan. 1856. No. **311***b*.

17. **P. niruroides** Muell. arg. in Journ. Bot., *l.c.*, p. 331, and in DC., *l.c.*, p. 409.

Diasperus niruroides O. Kuntze, *l.c.*, p. 600.

Sierra Leone.—In deserted or neglected fields near Freetown; fl. and fr. Sept. 1853. No. **316**.

18. **P. microphyllinus** Muell. arg. in Journ. Bot., *l.c.*, p. 332, and in DC., *l.c.*, p. 409.

Diasperus microphyllinus O. Kuntze, *l.c.*, p. 600.

Pungo Andongo.—In mountainous cultivated places near the præsidium; fl. and fr. Feb. 1857. Only one specimen. No. **312**.

19. **P. longifolius** N. J. Jacquin, Pl. Rar. Hort. Schœnbr. ii. p. 36, t. 194 (1797) (*longifolia*).

Averrhoa acida L. Sp. Pl., edit 1, p. 428 (1753). *Cicca disticha* L. Mant. Pl. p. 124 (1767); Lam. Encycl. Méth. ii. p. 1 (1786), and Tabl. t. 757, f. 1 (1798). *P. Cheramela* Roxb. Hort. Beng. p. 104 (1813). *P. Cicca* Muell. arg. in Linnæa, xxxii. p. 50 (1863). *P. distichus* Muell. arg. in DC., *l.c.*, p. 413. *Diasperus distichus* O. Kuntze, *l.c.*, p. 599.

Cape de Verde Islands.—A small, elegant tree, 8 ft. high; leaves at the tops of the branches contorted; flowers yellowish, on the bare older branches. In a place deserted after cultivation behind Villa da Praia, in the island of S. Thiago, only one tree seen, with comparatively few flowers, probably introduced; Jan. 1861. No. **3023**.

The leaves are less acute than usual in the species.

20. **P. discoideus** Muell. arg. in Linnæa xxxii. p. 51 (1863), and in DC., *l.c.*, p. 416; Ficalho, Pl. Uteis, p. 249 (1884).

Cicca discoidea Baill. Adansonia, i. p. 85 (1860). *Diasperus discodeus* O. Kuntze, *l.c.*

Golungo Alto.—A small, evergreen tree; leaves somewhat fleshy, obscurely green, somewhat glossy above, pallid beneath, distichous (as are also the branches and branchlets); fruit tricoccous; in mountainous places, Altura do Cimiterio near Sange; in young fr. 13 Dec. 1854.

A tree, not milky; May. A tree, 30 ft. high, with adult leaves; Quisucula, June 1856. A tree, 25 to 30 ft. high or rarely smaller; leaves evergreen, coriaceous, glossy, almost fleshy; in hilly places near the Sange cemetery, sporadic; adult leaves in June. A handsome tree, 30 to 50 ft. high; wood white, excellent; branches patent; branchlets and leaves distichous; flowers dicœcious; in the primitive forests of Quisucula, sporadic; female fl. end of Sept. 1855, male fl. Oct. 1855. A tree, 15 to 30 ft. high; leaves deciduous, when fully developed fleshy-coriaceous, as well as the branches distichous; sap not milky, watery; in the same forests near Bango-Aquitamba and also near Sange; fl. Oct. 1855. Native names "Caretéte" or "Caletete" or "Mutete." No. **340**. The lichens nn. 99, 187, 192, 341, 379, and 380 grew on the trunks and branches of this tree.

Prince's Island.—A tree, 25 to 30 ft. high, with the habit almost of a *Celtis*, at the time of flowering with imperfectly developed foliage; branches patent, branchlets numerous; flowers yellowish greenish. In primitive forests on Pico do Papagaio, at an elevation of 2000 ft.; fl. Sept. 1853. No. **339**.

In Pungo Andongo the name "Mutete" is used for *Pterocarpus erinaceus* Poir.; Welw. herb. no. 1864; *ante*, p. 279.

According to Welwitsch's ms., "Caretete," a tall tree with distant leaves, grew in Pungo Andongo, and in the same district another tree, 15 to 20 ft. high, with larger fruit, also called "Caretete," grew in small woods in the præsidium.

7. **FLUGGEA** Willd.; Benth. & Hook. f. Gen. Pl. iii. p. 276.

1. **F. microcarpa** Blume, Bijdr. Fl. Ned. Ind. p. 580 (1825).

Phyllanthus virosus Roxb. ex Willd. Sp. Pl. iv. p. 578 (1805). *Xylophylla obovata* Willd. Enum. Pl. Hort. Bot. Berol. p. 329 (1809). *P. lucidus* Hort. ex Willd. Enum., *l.c.* *Phylanthus angulatus* Schum. & Thonn. in Danske Vidensk. Selsk. iv. p. 189 (1829). *P. dioicus* Schum., *l.c.*, p. 190. *Securinega obovata* Muell. arg. in DC. Prodr. xv. 2, p. 449 (1866). *Acidoton obovatus* O. Kuntze, Rev. Gen. Pl. ii. p. 592 (1891).

Loanda.—A shrublet, 2 to 4 ft. high; stems numerous, as well as the branches whitish and angular; leaves herbaceous, pallid-glaucescent beneath, with pellucid veins; flowers yellowish in the bud. In dry bushy hilly places above Forte de Penedo and in *Adansonia* plantations near Cacuaco, rather rare; fl. April 1854. No. **627**.

Bumbo.—A tall shrub of 8 to 10 ft. in height, perhaps the young state of a small tree; head lax; branches and branchlets spreading; flowers whitish. At the outskirts of primitive forests near Bumbo, close to the base of the mountains of Serra da Xella, among other shrubs; not yet in good fl. Oct. 1859. No. **337**.

In our specimens the leaves are small, $\frac{1}{4}$ to $\frac{3}{4}$ in. long, and the branchlets are sometimes spinescent at the tip; it is therefore difficult to distinguish them from *F. Leucopyrus* Willd. Sp. Pl. iv. p. 757 (1806), the type species of the genus, although Muell. arg., *l.c.*, quotes No. 337 under his *S. obovata*; perhaps the two species will require to be united.

8. **CYCLOSTEMON** Blume; Benth. & Hook. f. Gen. Pl. ii. p. 279.

1. **C. euryodes** Hiern, sp. n.

A dicœcious tree with the habit nearly of *Eurya*, an upgrowth from a mutilated one when 10 to 12 ft. high having a trunk

4 in. in diameter, glabrous except the inflorescence; branches and branchlets spreading, dichotomous, leafy, pallid, rather slender; leaves alternate, ovate-oblong, narrowly acuminate at the apex, somewhat unequal and cordate at the broad base, chartaceous, pale green and shiny above, subglaucescent beneath, very shortly petiolate, undulate and serrulate-crenulate on the margin, 2 to 4 in. long by $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad; venation slender, not conspicuous; stipules lanceolate, paucidenticulate, ciliate about the apex, very deciduous; female flowers axillary, yellowish, solitary, subsessile, apetalous; sepals 5, imbricate, rotund, $\frac{1}{8}$ to $\frac{1}{5}$ in. in diameter, thickly beset with short hairs on both faces, shortly ciliate, thickly coriaceous; disk hypogynous, saucer-shaped, $\frac{1}{5}$ in. in diameter, unequally 5-cleft, somewhat fleshy, shortly ciliate; the segments broad, very obtuse, opposite the sepals; ovary 2-celled, tomentellous, somewhat compressed, subquadrate, $\frac{1}{8}$ in. long and broad; styles very short; stigmas thick, dilated, $\frac{1}{8}$ in. in diameter; ovules geminate.

Pungo Andongo.—In wooded rocky parts of Barranco da Pedra Songue, in the præsidium, sporadic; a few specimens in female fl. Jan. 1857. No. **1268**.

This species has much the aspect of *C. argutus* Muell. arg., but it differs by the subsessile flowers.

The following No. is perhaps a new species of this genus; it has the aspect of Sapotaceæ:—

A very elegant bush, 5 to 12 ft. high, perhaps a young tree; trunk straight; branches glabrate, dark-ashy, nodulose or obtusely tetragonal; branchlets alternate, tawny-brown, puberulous or tomentellous with short pallid hairs, leafy; leaves alternate, obovate-oblong or narrowly elliptical or oval, obtuse or subacute at the apex, obtusely narrowed or subcuneate at the shortly petiolate base, firmly and thinly coriaceous, subglabrate or with scattered inconspicuous hairs and pale subglaucescent green above, pilose along the raised tawny-brown midrib and drab beneath, delicately penniveined, very delicately reticulate beneath, entire, 1 to $4\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{2}$ in. broad; petiole $\frac{1}{15}$ to $\frac{1}{8}$ in. long, rather thick, hairy; stipules roundish, about $\frac{1}{12}$ in. long, densely hairy on the back, glabrous within, very caducous; flowers apparently dicœcious; the male flowers solitary geminate or ternate, axillary or lateral on the branchlets, bibracteate at the base, subglobose, subsessile or very shortly stalked; bracts roundish, tomentellous on the back, concave, about $\frac{1}{7}$ in. long; flower-buds subglobose, about $\frac{1}{6}$ in. long, tomentellous; calyx apparently consisting of about 5 imbricate rather thick broad obtuse segments; petals apparently 0; stamens numerous; filaments free among themselves; ovary 0.

Huilla.—In rocky moist parts of small woods between Catumba and Ohai; male fl-bud, beginning of April 1860. No. **1273**.

9. **PAIVÆUSA** Welw. ex Benth. & Hook. f. Gen. Pl. i. p. 993 (1867), and in Trans. Linn. Soc. xxvii. p. 20.

1. **P. dactylophylla** Welw. ex Oliv. Fl. Trop. Afr. i. p. 328 (1868), and in Trans. Linn. Soc. xxvii. p. 21, t. 7 (1869).

Huilla.—A resinous tree, 8 to 15 ft. high, not or scarcely milky; trunk erect, straight, 2 to 6 in. in diameter at the base branches and branchlets somewhat tortuous, very rigid, patent, tuberculate and transversely very rough with the scars of fallen leaves; leaves deciduous, alternate, digitately 5- to 7-foliolate, apparently exstipulate; leaflets articulated to the common petiole, coriaceous, shining, tomentose beneath; common petiole long; flowers dicœcious; male flowers usually appearing in the absence of the leaves; female flowers solitary in the axils of the leaves at the ends of the congested branchlets, very shortly pedunculate; peduncle included in an adnate sheath which is tridentate at the apex down to the middle; calyx 6- or 7-cleft, with linear-subulate tomentose teeth; disk annular; ovary sessile, surrounded at the base by the calyx-teeth, bilocular; the cells bi-ovulate; the ovules pendulous geminately from the apex of the cell, anatropous; style simple, very short or obsolete; stigma broadly bilobed; the lobes thick, stigmatose at the inner face; epicarp bivalved; pyrenes long, enclosed in a somewhat fleshy mucous membrane; seeds exalbuminous; testa (unripe) somewhat fleshy. In rather dry spots in the less dense forests between Lopollo and the river Monino, sparingly, in company with Combretaceæ, Myrtaceæ, and Proteaceæ; male and female fl. and fr. towards the end of Feb. 1860. The specimens with male flowers were plucked in great haste, for the tree on which they grew was within the range of the storming hordes of the Munanos savages with whom war was being waged. No. **452**, Coll. Carp. 955.

10. **OLDFIELDIA** Benth. & Hook.; B. & H. f. Gen. Pl. iii. p. 281.

1. **O. africana** Benth. & Hook. in Hook. Kew Journ. ii. p. 185, t. 6 (1850).

Sierra Leone.—A tall extensive tree, with the habit entirely of a *Vitex*, apetalous, dicœcious; wood excellent, whitish; leaflets quite glabrous, coriaceous, much acuminate; stamens 2 to 7; filaments straight, unequal in length; anthers basifixed, rotundate-ellipsoidal, bilocular; the cells opposite, longitudinally dehiscent. In woods on the north side of the colony, where it forms vast forests and whence it is exported in large quantities under the name of "African Teak" for ship-building; male fl. Sept. 1853. No. **478**.

11. **UAPACA** Baill.; Benth. & Hook. f. Gen. Pl. iii. p. 282.

1. **U. benguelensis** Muell. arg. in Journ. Bot. ii. p. 332 (Nov. 1864), and in DC., *l.c.*, p. 491; Ficalho, Pl. Uteis, p. 249 (1884) (*U. benguellensis*).

Huilla.—A handsome tree, usually 15 to 20 sometimes 25 to 30 ft. high or even more, with the habit of *Mamboga stipulosa* (Welw. herb. no. 3027) or of *Anthocleista macrantha* Gilg. (Welw. herb. no. 6021), evergreen, not milky, flowering when only 8 ft. high; trunk 1 to 1½ ft. in diameter at the base; branches spreading, whitish, as well as the branchlets marked with scars and longitudinal cracks; leaves crowded at the tips of the branchlets, obovate, dryly coriaceous, hard, glossy above, greenish-yellowish beneath, persistent; petiole short, furnished on each side with a long linear quickly deciduous stipule; flowers apetalous, clustered in bundles on the leafless parts of the branchlets;

involucre composed of several segments, corolliform, yellowish; several male flowers densely clustered about a fleshy stalk; bracteoles membranous, denticulate; stamens 4 to 6; anthers resembling those of Urticaceæ, inserted around a fleshy bilobed column by means of the flattened filaments. In the less dense rather dry forests between Lopollo and the river Monino, sporadic and rather rare, in company with species of Combretaceæ (cf. *Combretum psidioides* Welw. herb. no. 4379) and *Leucadendron;* male fl. Feb. 1860. No. **453**. A tree, about 15 ft. high, not flowering at the end of March 1860, in the same locality as the last No.; apparently the same species, although the leaves do not narrow so gradually towards the base. No. **454**. A tree of 15 to 25 ft. or in thickets and secondary woods 8 to 10 ft. high; trunk attaining nearly a foot, usually about 6 in. in diameter, with a dense head; the spreading branches and branchlets scattered or opposite, tortuous, divaricate, somewhat cinereous, tuberculate with the large scars of fallen leaves; leaves alternate, crowded at the tops of the branchlets, elliptical, very hard-coriaceous, penninerved, marked beneath with the very thick midrib and prominent acutely edged lateral nerves, whitish-lepidote, and with somewhat crisp hairs at the transverse veins, pale green above but little glossy and marked with the impressed nerves; petioles $\frac{5}{8}$ to $\frac{7}{8}$ in. long, articulate to the branchlets; flowers typically dicœcious, from whitish to pale yellow, the female ones as large as a moderate-sized pea, solitary in the axils of the leaves, subsessile or very shortly pedunculate; peduncles cinnamon-tomentose; calyx tetraphyllous, the segments opposite, the outer ones much the smaller, bracteole-like and tomentose, the inner ones subcorolline and tomentose on the keel; petals 5 to 7 or rarely 8, inserted on a somewhat fleshy torus, some opposite to the calyx-segments, others alternate to them, obovate-elliptical, concave, connivent during the flowering, whitish or yellowish, soon turning dusky and deciduous, imbricate in the bud, unequal in size and shape; disk fleshy, glandular, shallowly cupuliform, 6- or 7-lobed, surrounding the base of the ovary; ovary sessile, large, globose-ellipsoidal, obtusely angular, densely tomentose, 4-celled; the cells bi-ovulate; the ovules collateral, pendulous from the top of the central angle of the columnar placenta, elongated; stigma sessile, very large, radiately 4-lobed; the lobes yellow, somewhat fleshy, flabellate in outline, digitately multifid, covering the whole of the ovary in the bud, persistent; fruit ellipsoidal, 6-ribbed, as large as a full-sized olive, 3-celled, monospermous; endocarp juicy-fleshy, bitter to the taste like pitch, reddish. In thin rather dry forests, at an elevation of 5000 to 5500 ft., between Lopollo and the great lake of Ivantâla, chiefly at No Monino, rather rare, in company with species of *Acacia* (cf. *A. robusta* Burch.; Welw. herb. no. 1833), Combretaceæ (cf. *Combretum psidioides* Welw. herb. no. 4379), Myrtaceæ (cf. *Eugenia guineensis*, var. *huillensis;* Welw. herb. no. 4403), and Proteaceæ; male fl. 1 March 1860, female fl. 13 March, end of March and 12 April 1860, ripe fr. 10 May 1860. No. **455**. A tree with large alternate coriaceous leaves. In forests near Lopollo; submature fr. April 1860, Coll. Carp. 241.

The sap is thin and whitish at first, but soon coagulates and turns yellow-dusky and glossy like resin; the fruit is said to be edible, but this statement is very doubtful. The native name is "N-bulla." Welwitsch collected his specimens and hastily examined them during the Monano war; he added that the calyx-segments pass gradually into the petals so that it becomes very difficult to decide precisely what belongs to the calyx and what to the corolla; only the two

outer calyx-segments are calycine. In the description of the parts of the flowers given above, the terminology used by Welwitsch has been followed ; though perhaps the flowers would be better regarded as apetalous.

"N-bûla" is the name of the fruit of a small tree which occurs between Lombe and Condo in Pungo Andongo ; it is the size of a walnut and the taste is very sweet and aromatic.

12. **ANTIDESMA** Burm., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 284.

1. **A. venosum** Tul. in Ann. Sc. Nat., ser. 3, xv. p. 232 (1851); Muell. arg. in DC. Prodr. xv. 2, p. 260 (1866).

A bifrons Tul., *l.c.*, p. 229. *A. rufescens* Tul., *l.c.*, p. 231. *A. Boivinianum* Baill. Adansonia ii. p. 45 (1861).

Barra do Bengo.—A small tree of 15 ft. high or in secondary thickets only a shrub of 5 to 6 ft. ; flowers from greenish to yellowish. In palm groves consisting of *Elæis guineensis* Jacq., between Quifandongo and the mouth of the river Bengo, sparingly ; male fl. Dec. 1853. No. **403**.

Golungo Alto.—In the secondary woods of Sobato de Bango Aquitamba ; female fl. Jan. 1855. No. **402**. A low tree, with an ample crown ; branches patent ; leaves subcoriaceous ; unripe berries or drupes somewhat vermilion. In the forests of Sobato de Mussengue (Cam. de Muss.) ; young fr. April 1855. No. **402** *b*.

The Lichen n. 275 in Sobata Mussengue in April 1855 grew on the leaves of an arborescent *Antidesma*, probably this species.

2. **A. membranaceum** Muell. arg. in Linnæa xxxiv. p. 68 (1865), and in DC., *l.c.*, p. 261.

Var. **molle** Muell. arg. (*ll.cc.*).

Golungo Alto.—A small, dicœcious tree, 8 to 15 ft. high, with a densely leafy head and the habit of *Salix caprea* L. ; leaves subcoriaceous, glossy. In secondary thickets close to the road to Banza de Bango near Bango Aquitamba, male fl. Feb. and Mar. 1855 ; also at Capopa, with male and female fl. and fr. No. **405**. A tree 10 to 15 ft. high ; branches divaricately patent ; leaves subcoriaceous ; flowers dicœcious, amentaceous, spicate. In wooded secondary thickets between Sange and Bango Aquitamba ; unripe fr. May 1855. No. **406**. A young tree never seen to flower, with somewhat the habit of Mutûje (*Myristica angolensis* Welw. herb. nos. 781 and 782). At the banks of the river Cuango, April 1856. Leaves ranging up to 11 in. long by $4\frac{1}{2}$ in. broad. Determination doubtful. No. **6706** *b*.

Pungo Andongo.—A loosely branched tree, 10 to 15 ft. high or occasionally attaining 25 ft., with the habit almost of *Salix caprea* L. ; leaves softly coriaceous, deep green ; fruit drupaceous or baccate, bright scarlet or brick-red when ripe, monopyrenous. In thickets at the sides of the gigantic rocks of the præsidium, rather rare, fr. end of Jan. 1857 ; also in damp wooded rocky places in Barranco de Songue, fr. Feb. 1857. No. **404**.

This is apparently the Antidesmacea mentioned by Welwitsch, Apontam. p. 547, n. 72 (1859).

The following No., with comparatively large (6 to 7 in. long by $3\frac{1}{2}$ to 4 in. broad) and nearly glabrate foliage, may be compared with this species and its varieties ; in the absence of flowers there is no certainty.

Golungo Alto.—A shrub 2 or 3 ft. high or perhaps a young tree. By the Ambaca road, without fl. or fr., Febr. 1855. No. **6706** *c*.

13. **HYMENOCARDIA** Wall.; Benth. & Hook. f. Gen. Pl. iii. p. 285.

1. **H. acida** Tul. in Ann. Sc. Nat., ser. 3, xv. p. 256 (1851); Muell. arg. in DC. Prodr. xv. 2, p. 477 (1866); Oliv. & Grant in Trans. Linn. Soc. xxix. p. 145, t. 94 (1875).

Ambaca.—A much branched shrub, 4 to 6 ft. high; stems erect; branches patent, as well as the branchlets brickred-pulverulent; leaves membranous, yellowish-lepidote beneath, the adult ones coriaceous; flowers dicœcious. By thickets between N-gombe and Puri Cacarambola, sparingly; fl. and unripe fr. Oct. 1856. No. **414**. A patently branched shrub, 4 to 6 ft. high; stems numerous; leaves glossy, somewhat fleshy and rigid, subglaucescent; fruit samaroid, obcordate, flatly compressed, purplish; styles 2. At the same place as the last No.; ripe fr. Oct. 1856. No. **414***b*.

Pungo Andongo.—A shrub, 5 to 6 or occasionally only 3 ft. high; branches and branchlets rigid, very hard; leaves coriaceous, glossy, hard, glandular-punctate beneath; fruit rosy-greenish-yellowish or rosy-purple. In thickets at the banks of the river Luxillo; fr. Feb. 1857. No. **413**.

Huilla.—A small, tortuously branched tree of 6 to 10 ft. or usually a shrub 5 ft. high; leaves glandular-punctate beneath. In rather open woods among shrubs, at the Lopollo cataract, between Lopollo and Monino, in company with Sapindaceæ (*Dodonæa viscosa* Jacq.; Welw. herb. no. 1692) and Myrtaceæ (cf. *Eugenia guineensis*, var. *huillensis*; Welw. herb. no. 4402); also in the Proteaceous forests of the Monino; fr. Nov. and Dec. 1859. No. **412***b*. A shrub as tall as a man, occasionally arborescent and 8 ft. high; branches divaricate; leaves clothed beneath with sulphur or saffron-coloured glands; flowers reddish. In elevated rocky places in Morro de Lopollo on the high plateau of Huilla towards Nene; male fl. Feb. 1860. No. **412**.

At Malange it is called "Mupeixe"; see Bol. Soc. Brot. xvi. p. 55 (1899).

2. **H. ulmoides** Oliv. in Hook. Ic. Pl. xii. p. 29, t. 1131 (1873); Pax in Engl. & Prantl, Nat. Pflanzenfam. iii. 5, fig. 19, A—C (p. 29) (1890).

Golungo Alto.—A tree 20 to 30 ft. high, at times only a shrub of 3 to 8 ft.; trunk 12 to 16 in. in diameter at the base, straight; head widely spreading; habit like an elm or Myrtaceous; flowers dicœcious; female flowers reddish, apetalous; calyx deeply 5-partite, almost 5-sepalous; the segments lanceolate, sometimes entire and acute, in other cases with two of them bilobed almost to the middle and broader than the rest; ovary flattened, bilocular, the cells bi-ovulate, the ovules pendulous from the apex of the cells; styles 2, elongated, diverging; fruit samaroid, lyrate, with a deep narrow incision at the apex, emarginate with the angle rounded and the rounded lobes incumbent at the apex, reddish or rosy greenish in the living state; seeds $\frac{1}{3}$ in. long, black; testa minutely wrinkled; embryo straight, $\frac{1}{5}$ in. long; cotyledons thinly membranous, whitish, elongate-ovate, obtuse, tri-nerved at the base, the lateral nerves short, the intermediate nerve running the whole length of the lamina; radicle cylindrical, clavate, half as long as the cotyledons or a little shorter; albumen somewhat horny. In the less dense primitive forests at the banks of the river

Cuango, occasional; female fl. Dec. 1855, fr. June 1856. No. **410**. Alto Queta; fl. and fr. Feb., May and June 1855. No. **410***b*.

Cazengo.—A much-branched tree 12 ft. high, with a dense head. In wooded rocky places on the right bank of the river Luinha, at an elevation of about 1800 feet; ripe fr. June 1855. No. **411**.

In Golungo Alto the native name is "Gusûzu" (used also for *Combretum dipterum* Welw,); the Cabinda name is "Sanha."

14. **THECACORIS** Adr. Juss.; Benth. & Hook. f. Gen Pl. iii. p. 286.

1. **T. Trichogyne** Muell. arg. in Journ. Bot. ii. p. 328 (1864), and in DC. Prodr. xv. 2, p. 246 (1866).

Pungo Andongo.—A small, sparingly and patently branched tree, 10 to 15 ft. high; head lax; branches and branchlets slender, somewhat flexuous; leaves coriaceous, somewhat shining; flowers greenish, the male ones like those of *Antidesma*. In small woods at the rivulet Tangue near the præsidium, without fl. or fr. Dec. 1856; also in the wooded parts of Barranco de Pedra Songue in the præsidium, sparingly; male fl. and fr. Jan. 1857. No. **415**.

15. **MICRODESMIS** Planch.; Benth. & Hook. f. Gen. Pl. iii. p. 287.

1. **M. puberula** Hook. f. in Hook. Niger Fl. p. 514. t. 26 (1849); Muell. arg. in DC. Prodr. xv. 2, p. 1041 (1866).

Golungo Alto.—An evergreen tree, 15 to 20 ft. high, with a broad leafy head, twisted branches, pendulous branchlets, and baccate fruit; unripe berries exactly spherical, green, borne on a pentaphyllous calyx, apiculate with the remains of the styles, trispermous. In the shady forests of the Alto Queta mountains at the base of the Serra, from Camilungo to Sange, sporadic; young fr. June 1855. No. **356**. A small tree, with twisted branches, drooping or pendulous branchlets and pentamerous orange-red flowers. In the very dense Alto Queta forests, rather rare; male fl. beginning of June 1855. No. **355***b*. A small tree, 10 to 15 ft. high; head widely spreading; trunk branching at the height of 4 to 5 ft.; branches divaricate, at length quite patent, with drooping branchlets and virgate twigs; leaves evergreen, glabrous except very sparse hairs, thinly coriaceous, elliptical, scarcely pellucid-punctate, deep green and glossy above, pallid and remarkably glossy beneath; flowers dicœcious, axillary; peduncles unequal; calyx of the female flowers subcampanulate, 5-cleft, with obtuse ciliate segments; petals 5, obliquely obovate, imbricate in the bud, rotately patent in the flower, bright scarlet or whitish-red, white-tomentellous outside, ciliate on the margin, hypogynous; ovary central, obovoid, subsessile, somewhat flat at the top, crowned with 6 penicillate stigmas which radiate from the centre towards the circumference; half-ripe capsule green, subglobose, more or less conspicuously trisulcate outside or tricoccous, trilocular; the cells monospermous. In the more elevated dense primitive forests of mount Cungulungulo in Sobato Cabanga Cacalungo and in the Alto Queta mountains, sporadic; female fl. and young fr. beginning of Nov. and 4 Dec. 1855, and in Feb. and March 1856. No. **355**.

The following No. appears to be an undescribed species of *Microdesmis*:—

A dicœcious tree; trunk branchedly spiny; leaves oval, shortly and obtusely subacuminate at the apex, nearly rounded unequal and inconspicuously 3- to 5-nerved at the base, thinly coriaceous,

glabrous, distantly penniveined above the base, delicately reticulate, $3\frac{1}{4}$ in. long by 2 in. broad, somewhat glossy on both faces, slightly paler beneath, remotely crenate-serrate; petiole somewhat dusky, channelled above, $\frac{1}{15}$ in. long; infrutescence racemose or further branched, glabrous; pedicels about $\frac{1}{8}$ in. long, often lenticellate, patent; fruit ellipsoidal, longitudinally marked with 5 or 6 broad ridges and intervening furrows, transversely furrowed across the middle, glabrous or minutely glandular, narrowed near the apex where it is crowned with the persistent glabrous reflected adpressed 5 or 6 styles which are connate at the base somewhat dilated at the apex and measure $\frac{1}{20}$ to $\frac{1}{15}$ in. long, narrowed near the base where remains the small glabrous or minutely glandular 5-cleft calyx, 5- or 6-celled, indehiscent, $\frac{2}{3}$ in. long, $\frac{1}{15}$ in. in diameter; seeds solitary in the cells.

Golungo Alto.—Among the Queta mountains; fr. Dec. 1855. Coll. Carp. 934.

16. **JATROPHA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 290.

1. **J. Curcas** L. Sp. Pl. edit. 1, p. 1006 (1753); Muell. arg. in DC. Prodr. xv. 2, p. 1080 (1866); Ficalho, Pl. Uteis, p. 250 (1884); Pax in Engl. & Prantl, Nat. Pflanzenfam. iii. 5, fig. 45 (p. 75) (1890).

Curcas purgans Medic. Malv. Fam. p. 119 (1787); Welw. Apontam. p. 564, sub n. 153 (1859).

Golungo Alto.—Usually a shrub of 5 to 7 ft., but in the mountainous parts of Sobato de Bumba and also near Bango arborescent with a trunk 8 to 10 ft. high and 9 in. in diameter. Everywhere wild about negro villages; also far from the dwellings of the natives in lonely places, and at the outskirts of thickets especially on a poor soil, sporadic nearly always, rarely in groups; also cultivated by fences as well as occasionally quasi-spontaneous, as for instance about Bango Aquitamba at Cerco do Cimiterio de Bango; fl. Dec. 1854 and Feb. 1855. The so-called "tapumes" (enclosures) round the "cubatas" (huts) of the negroes are frequently made of these bushes. No. **303**. No notes; fr. Coll. Carp. 928.

The negroes call this plant "Mupulúca." Two or three of the seeds for a dose are used as a purgative medicine.

Island of St. Thomas.—No notes. Leaves only. Local name "Glon." Determination quite doubtful. No. **6766**. Fr. Dec. 1860. Called "Purgo do Ilha de S. Thomé." Apparently this plant. Coll. Carp. 929.

The following No. somewhat resembles this species, but the branches, petioles and nerves of the leaves are pubescent and the leaf-blades are denticulate with the short productions of the veinlets beyond the margins; if of this genus, it is probably a distinct species:—

Golungo Alto.—A small tree, 4 ft. high; branches virgate-elongated, erect-spreading, here and there aculeate. In the rather dense Quibanga forests near Sange; without fl. or fr. May 1856. No. **4899**.

2. **J. glandulifera** Roxb. Hort. Bengal. p. 69 (1814), and Fl. Ind. iii. p. 688 (1832); Muell. arg., *l.c.*, p. 1084.

J. glauca Willd. Sp. Pl. iv. p. 558 (1805), excl. syn.; non Vahl (1790). *J. gossypiifolia* Welw. Apontam. p. 564, sub n. 153 (1859), vix *J. gossypifolia* L. (1753).

Loanda.—An undershrub, leafless at the time of gathering; root thick; stems erect, viscid; flowers red. In very dry places on hard sand soon after the first spring rains; fl. and fr. Oct. 1853 and Sept. 1854. No. **309**. A perennial herb, 1 to 2 ft. high, sometimes in every respect herbaceous, in other cases suffruticose, with a thick deeply descending monocephalous or dicephalous juicy root, strongly resembling mandioc in habit, remarkable for the presence of red-headed stalked viscid glands on the margins of the leaves and around the stipules; leaves herbaceous-green, glaucescent-pallid beneath; flowers bright scarlet, occurring twice in a year, first without the leaves after the October to December rains, and the second time with the leaves. In the drier, sparingly bushy pastures near Loanda, plentiful and ubiquitous at Penedo, Maianga do Povo, etc.; fl. and fr. Dec. 1853 and Jan. and June 1854. No. **308**. At Penedo; capsules and seeds Jan. 1858. Coll. Carp. 927.

This is the undershrub with scarlet flowers related to the genus *Jatropha*, which was mentioned by Welw. in Ann. Cons. Ultramar. Lisb., No. 7, Aug. 1854, p. 84, n. 87.

3. **J. glauca** Vahl, Symb. Bot. i. p. 78 (1790); non Willd. (1805).

Croton lobatum Forsk. Fl. Ægypt.-Arab. pp. xcviii. cxxi. 162 (1775). *J. lobata* Muell. arg., *l.c.*, p. 1085.

Var. **senegalensis** (Muell. arg., *l.c.*, p. 1086).

Mossamedes.—An erect, branched, fleshy shrub, 5 to 6 ft. high; flowers yellowish; capsules as big as a walnut, or even bigger. By fences around cotton plantations half wild and in thickets at the edges of mandioc fields near the mouth of the river Bero; perhaps formerly introduced; fl. and fr. July 1859. No. **299**.

4. **J. multifida** L. Sp. Pl., edit. 1, p. 1006 (1753); Muell. arg., *l.c.*, p. 1089.

Sierra Leone.—An undershrub or even a shrub of 6 to 8 ft. high; stems, branches and leaves somewhat fleshy; flowers brilliantly scarlet. Cultivated everywhere by dwellings and also wild in many parts of the district; about Freetown, fl. and fr. Sept. 1853. No. **298**.

It is cultivated also at Mossamedes. This is apparently the small very elegant tree, with multifid leaves and scarlet corymbose flowers, occurring by fences near Freetown in Sept. 1853, which was mentioned by Welwitsch, *l.c.*, p. 80, n. 16.

17. **CROTON** L.; Benth. & Hook. f. Gen. Pl. iii. p. 293.

1. **C. Mubango** Muell. arg. in Journ. Bot. ii. p. 338 (1864), and in DC. Prodr. xv. 2, p. 514 (1866); Ficalho, Pl. Uteis, p. 251 (1884).

Golungo Alto.—A very elegant tree, 12 to 20 ft. high; trunk 6 to 12 in. in diameter; head widely spreading, depressed at the top, dense, party-coloured; branches patent; branchlets drooping; flowers monœcious, white, spicately racemose or typically racemose, the racemes drooping. In rather dry sandy hilly places about negro

villages, plentiful, after the manner of elms in Europe, thriving well in Sobato de Bumba ; fl. and young fr. 22 Oct. 1855. No. **348**. A tree of moderate size, with discolorous leaves and racemose monœcious flowers. At the outskirts of forests near Sange, fr. ; also frequently cultivated. COLL. CARP. 930.

This tree is a frequent ornament of the hilly borders of forests on the interior plateau of Angola, particularly in the districts of Golungo Alto, Ambaca, and Pungo Andongo ; it varies, according to the nature and humidity of the soil, etc., in the breadth and even in the silky lining of its leaves ; the younger plants and the shoots from the stumps of old trees always have broader leaves, and the stipules are more luxuriant ; the largest leaves fall off at the time of flowering. The negroes of Golungo Alto call the tree "Mubângo" ; and the root, as well as the brown gum which exudes from the trunk, is used by the native medical men as a drastic purgative, in the form of a decoction together with that of the root of Mundondo (cf. *Chlorocodon Whiteii* Hook. f. and *Tylophora conspicua* N. E. Br.). A decoction of the rind of the root, mixed with the leaves or stems of Mobiro (cf. *Adenia lobata* Engl.), is an excellent anthelmintic remedy. (See Welw. Synopse Explic. p. 32, n. 78, p. 37, n. 99, p. 56, sub n. 146). The dose as a purge is a teaspoonful of the Mubango powder for an adult person. The wood is white and firm, but easily cracks ; when in flower the tree is much frequented by bees ; the fruit is tricoccous and nearly the size and colour of a medlar. Welwitsch very highly recommended this tree for planting at Loanda on account of the excellent shade which it affords and because it thrives well in a parched nearly rainless climate and not less so in a rich soil ; it remains to be proved whether it dislikes the seaside.

In Loanda the name "Mubanga" or "Mubango" is used for a very different tree, namely, *Acacia Welwitschii* Oliv. ; Welw. herb. no. 1806. According to Welwitsch's ms. the Euphorbiaceous Mubango is a common tree in the district of Pungo Andongo.

2. **C. Welwitschianus** Muell. arg. in Journ. Bot., *l.c.*, p. 338, and in DC., *l.c.*, p. 515.

HUILLA.—A small tree ; head fastigiate ; branches and branchlets verticillate ; leaves very bright green above. In rather dense forest near Lopollo, where the Munanos' camp was erected, in company with species of Mimoseæ (cf. *Gigalobium abyssinicum* ; Welw. herb. no. 1782*b*), *Tarchonanthus camphoratus* L. (Welw. herb. no. 3524), and Proteaceæ ; scarcely in good fl. beginning of April 1860. No. **341**.

3. **C. Draconopsis** Muell. arg. in Journ. Bot., *l.c.*, p. 338, and in DC., *l.c.*, p. 522.

AMBRIZ.—A small tree ; branches elongated, rambling, leafy at the apex. In damp forests near Ambriz, in company with *Flagellaria guineensis* Schum. (Welw. herb. no. 3009) ; fl. Nov. 1853. No. **343**.

CAZENGO.—A tree of 20 ft. high (at the time of gathering a young one) ; branches patent ; branchlets and flowering spikes erect. In the more elevated primitive forests in Serra de Muxaûla, rather rare ; fl. Dec. 1854. No. **347**.

GOLUNGO ALTO.—A tree, 6 to 8 in. in diameter at the base of the trunk, the sole remains of the burnt tree ; branches springing round the trunk crowded, erect, hispid with hairs directed backwards ; bark grey, as are also the petioles of the leaves. On the left bank of the river Cuango, at the outskirts of palm groves, among maize crops ; without fl. or fr. end of Aug. 1855. Collected also in the same place

in Oct. 1855, when the leaves had already begun to wither and the large lower leaves had all fallen. No. **445**. A small tree, 7 to 8 ft. high; trunk 4 in. in diameter; leaves membranous, rather rigid; flowers white, very caducous. In secondary thickets on the right bank of the river Cuango, behind Rodrigo's cubata; male fl. beginning of Jan. 1856. Also young branches or trunks of a burnt tree, 6 ft. high; all the lower leaves very large and as well as the stem lepidote-branny; in a "varzea" (moist meadow) in the same locality; sterile fl. Feb. 1856. No. **345**. A robust shrub, perhaps a tree; branches long, ascending; lower leaves very large; flowers white. In secondary thickets of declivities close to the banks of the river Cuango; fl. beginning of March 1856. No. **347***b*.

On the leaves of this tree grew the Fungus n. 77, *Exosporium celatum* A. L. Sm. in Journ. Bot. xxxvi. p. 179 (1898)=*Sporidesmium celatum* Welw. and Curr. in Trans. Linn. Soc. xxvi. p. 292 (1868).

The following No. possibly belongs here :—

Golungo Alto.—An undershrub or a shrub, subsequently burnt down. Below Rodrigo's house; leaves only. No. **6731**.

4. **C. oxypetalus** Muell. arg. in Journ. Bot., *l.c.*, p. 339, and in DC., *l.c.*, p. 543.

Pungo Andongo.—A tree, 15 to 20 ft. high; head broadly frondose, widely spreading, hemispherical, depressed at the top; leaves of full-grown trees sulphur-yellow beneath; flowers monœcious, yellowish. In rather dense forests in Mata de Cabondo in the præsidium, sporadic; fl. and fr. Dec. 1856 to March 1857. Native name "Mubango de Cabondo." No. **346**.

5. **C. pyrifolius** Muell. arg. in Journ. Bot., *l.c.*, p. 338, and in DC., *l.c.*, p. 550.

Golungo Alto.—A broadly frondose tree, 20 ft. high; trunk 1½ ft. in diameter at the base; flowers monœcious, white; habit like a poplar's. In forests at the river Quiapoze in Sobato de Mussengue, fl. beginning of Jan. 1856; and at Bumba de Bango, fl. beginning of Jan. 1855; also in rather elevated dense primitive forests at the Capopa spring near Sange, Jan. to March 1856. This tree prefers the densest forests; the native name is "Mubango ià muxito." No. **344**.

The Fungus n. 412 grew on the small trunk of a *Croton* (perhaps this species) in Mata de Quibanga in Jan. 1855.

6. **C. angolensis** Muell. arg. in Journ. Bot., *l.c.*, p. 339, and in DC., *l.c.*, p. 602.

Pungo Andongo.—A shrub, 5 to 6 ft. high; branches virgate, spreading, leafy towards the apex. Seen only in the shady wooded part of Mata de Pungo, near Pungo Andongo; one individual, with very few flowering shoots; male fl. Jan. 1857. No. **392**.

18. **RICINODENDRON** Muell. arg.; Benth. & Hook. f. Gen. Pl. iii. p. 297.

1. **R. africanum** Muell. arg. in Flora 1864, p. 533 (9 Nov.) and in DC. Prodr. xv. 2, p. 1111 (1866) (*africanus*); Ficalho, Pl. Uteis, p. 251 (1884).

Golungo Alto.—A tree, 20 to 30 ft. high, or rarely more, with its trunk straight, and from its base to two-thirds of its height divested of branches, somewhat resembling a large *Carica Papaya* L.; wood

white and even in grain like that of a *Tilia* and used for the same purposes; bark of the branches and upper part of the trunk bright herbaceous-green, smooth, deeply furrowed, thin, patent, crowded at the top of the trunk; leaves palmate; leaflets 5 to 7, peltately arranged; petiole very long, bi-stipulate at the base; stipules lateral, large, uniform, crest-like, digitately laciniate, or deeply dentate-fimbriate on the margin, spreading horizontally, semi-amplexicaul; flowers dicœcious, lightly paniculate, the whole inflorescence from dusky to yellowish tomentose; corolla of the male flowers yellowish; glands among the stamens 5, large. Sap thin, and of nearly every part greenish-watery and viscid; at length when dry forming a brown resin. In the elevated primitive forests of Serra de Alto Queta, in the Sobatos of Bumba and Banga Aquitamba and near Banza de Bumba, sporadic; without fl. June 1855; with fl. 22 Oct. 1855. No. **443**.

Cazengo.—A tree, 20 to 40 ft. high; head widely spreading; wood whitish, like that of *Tilia*; leaves 5- to 7-cleft; flowers dicœcious. By a road; fr. June 1855. Coll. Carp. 931.

Negro name "Munguella."

The following No. perhaps belongs here; the negroes of the district also call it "Munguella":—

Cazengo.—A tree, 20 to 30 ft. high; trunk bare for a long distance from below, loosely branched at the apex; branches patent-erect, elongated, leafless at the base, furnished towards the apex with long-stalked leaves; leaflets (in one case) 7, elliptical-oblong, cuspidate at the apex, wedgeshaped to the sessile base, thinly coriaceous, glabrous, deep green and somewhat glossy above, paler beneath, entire or with a few mostly obsolete glandlike teeth on the margin, peltately placed on the petioles, the largest nearly a foot long by $3\frac{1}{2}$ in. broad; petioles ranging up to $2\frac{1}{2}$ ft. long, deeply furrowed, glabrous. In the more elevated dense primitive forests of Serra de Muxaûla; without fl. or fr. June 1855. No. **444**.

19. **MANNIOPHYTON** Muell. arg.; Benth. & Hook. f. Gen. Pl. iii. p. 297.

Anisochlamys Welw. ex Muell. arg. in Journ. Bot. ii. p. 332 (1864).

1. **M. fulvum** Muell. arg. in Journ. Bot., *l.c.*, and in DC. Prodr. xv. 2, p. 720 (1866).

Anisochlamys polymorpha Welw. ex Muell. arg. in Journ. Bot., *l.c.*

Golungo Alto.—A shrub climbing among other shrubs, with sarmentose branches, 12 to 20 ft. long, beset with straight rigid horizontally spreading stinging hairs; sap watery; leaves very variable in shape; flowers dicœcious. Calyx of the male flowers bifid or trifid, the lobes irregular and obsoletely 1- to 2-toothed at the apex; corolla from whitish to yellowish, cyathiform-campanulate, irregularly denticulate at the mouth, inserted at the bottom of the calyx, strictly gamopetalous; stamens more than 12, inserted without order on the thin glandular disk which is hispidulous on the margin, as long as the corolla; anthers cordate, introrse, bilocular, dehiscing longitudinally, exserted or subexserted, yellowish; rudiments of the ovary 0. Calyx of the female flower regularly 5-toothed, almost 5-lobed, the teeth acute; petals 5, obovate, yellow-greenish, inserted at the outer base of the glandular thin disk, larger and longer than the calyx, patent at the time of the flowering; ovary sessile on the disk, hispid; styles arching-patent, stigmatose at the apex. In the dense primitive forests

of the mountains of Serra de Alto Queta, not uncommon; fl. beginning of Dec. 1855; also at the banks of the rivulet Cate in Sobato de Bumba, not plentiful; leaves deeply trifid; without fl. Jan. 1855. No. **349**. A scandent shrub, with very polymorphous foliage. In the denser forests of the Queta mountains; without fl. Dec. 1855. No. **350**. A robust, climbing shrub, with stinging leaves and a Menispermaceous habit. Queta Carengue; fr. May 1856. Coll. Carp. 933.

Island of St. Thomas.—In wooded mountainous places at Fazenda do Monte Caffé; without fl. Dec. 1860. Called "Congo gloncongo." Leaves not trifid, very like the usual ones in this species. No. **463**.

20. **CLUTIA** Boerh., L.; Benth. & Hook. f. Gen. Pl. iii. p. 302 (*Cluytia*).

1. **C. benguelensis** Muell. arg. in Journ. Bot. ii. p. 337 (1864), and in DC. Prodr. xv. 2, p. 1052 (1866) (*Cluytia*).

Huilla.—A perennial herb, with the habit of the genus and of *Phyllanthus*; rootstock very thick, woody, polycephalous; stems several, 1 to 1½ ft. long and more; straight, but little branched; leaves glaucescent, somewhat fleshy; flowers yellowish. In rocky thickets near Mumpulla, plentiful, in company with species of *Gnidia* (cf. *G. Rendlei*; Welw. herb. no. 6478), *Thesium* (cf. *T. lopollense*; Welw. herb. no. 6437), *Osyris abyssinica* Hochst. (Welw. herb. no. 6438), and other Euphorbiaceæ; fl. Oct. 1859. No. **338**.

21. **AGROSTISTACHYS** Dalz. (1850); Benth. & Hook. f. Gen. Pl. iii. p. 302.

1. **A. africana** Muell. arg. in Flora, 1864, p. 534, and in DC. Prodr. xv. 2, p. 725 (1866).

Island of St. Thomas.—In mountainous primitive forest, about 2000 ft. alt., at Fazenda de Monte Caffé; unripe fr. Dec. 1860. No. **441**.

22. **MANIHOT** Adans.; Benth. & Hook. f. Gen. Pl. iii. p. 306.

1. **M. utilissima** Pohl, Pl. Bras. i. p. 32, t. 24 (1827); Muell. arg. in DC. Prodr. xv. 2, p. 1064 (1866); Ficalho, Pl. Uteis, p. 251 (1884): Pax in Engl. & Prantl, Nat. Pflanzenfam. iii. 5, fig. 49 (p. 80) (1891).

Jatropha Manihot L. Sp. Pl. edit. 1, p. 1007 (1753). *M. edule* A. Rich. in Ramon de la Sagra Hist. Cuba, xi. p. 208 (1850); Welw. Apontam. p. 563, sub n. 153 (1859) (*edulis*). *M. Aipi* Welw., *l.c.*, p. 564; non Pohl.

Loanda.—Very frequently cultivated throughout the district, but rarely flowering; at Represa do Magellaēs near Boa Vista; fl. and fr. end of March 1854. No. **301**.

Golungo Alto.—A slender shrub, 6 to 9 ft. high. In the very dense forests of Cungulungulo near Vistalegre, quasi-spontaneous; without fl. or fr. Feb. 1855. No. **302**.

Mossamedes.—An undershrub, 4 to 6 ft. high; stems and petioles rosy-purplish; flowers yellowish. Cultivated in large quantities throughout the district for the sake of its tuberous root, which weighs from 5 to 25 lb., and is by no means so poisonous as is commonly reported; Arimo de Senhor Paiva, on the Giraûl; fr. 15 July 1859.

Colonial name "Mandioca," "Manhioca," "Farinha do paõ," "Mandioce doce," etc. No. **300** and Coll. Carp. 922. A form with the lower leaves trifid and the upper leaves quinquefid. In the Giraûl fields mixed with the ordinary form; fr. July 1859. No. **300***b*.

This is the most valuable among the cultivated plants of the family in Angola; it is extensively cultivated in all parts of the province, and provides the bread of the negro population; it is also eaten in the raw state, just as it is removed from the soil, without even the least injurious results; it consequently can there contain little or none of the poisonous principle which appears to abound in the greater part of the varieties of the species or of the allied species which are cultivated in tropical America. See Welw., *l.c.*, p. 564. The very fine meal which is obtained from the roots is called "Fuba," "Fuva," or "Fuba iá N-bombo;" and in course of its preparation sieves (those of an Egyptian pattern are called "Mussalo" or "N-salo" [?]) are used in the mountainous districts of Golungo Alto, Ambaca, etc., made from the textile plants called "Subi," that is, *Donax purpurea* K. Schum. and *Phrynium textile* Ridl. The tubers are called "Caringa." Fuba, mixed with the pounded root of *Amomum erythrocarpum* Ridl., is a remedy for pains of the abdomen.

Manioc is almost wild in the Quilombo-Quiacatubia forests in Golungo Alto, where it occurs as a shrub 9 ft. high; but its root is then by no means thick, and is scarcely edible owing to its bitterness. In Pungo Andongo the fuba meal is made into dry cakes, which keep a long time and are called "Quiquanga," or "Quicoanga," or "Bombó." "Quinbombo" is a fermented drink prepared from mandioc and other meal; it is also called "Pombe," and when sweetened with honey it is called "Cassûlo."

The negroes of Sange purposely throw into the adjacent streams, the Cuango and Quiapose, roots of mandioc, in order to make the waters more tasty; the putrid smell thus produced causes the other inhabitants to fetch their drinking water from the small spring of Quiquele-quele on the north-west of the town. At Loanda the plant is called "Quisaca."

The word *Mandioca*, although used at times by the people of the interior of Angola, is not strictly derived from the Bunda language, but, according to José Villela de Barros (Memor. da Ac. R. d. Sc. de Lisboa, vol. vii., Mem. Corresp. p. 52, 1821), belongs to the idiom of the American Indians, and is compounded of *mandi* = house, and *oca* = bread. There are two varieties of the plant, one called *mandioca branca* or white mandioc (caxorá), and the other *mandioca roxa* or purple mandioc, that is, with violet-red petioles and stem.

23. **HASSKARLIA** Baill.; Benth. & Hook. f. Gen. Pl. iii. p. 308.

1. **H. didymostemon** Baill. Adansonia, i. p. 52 (1860); Muell. arg. in DC. Prodr. xv. 2, p. 774 (1866); Ficalho, Pl. Uteis, p. 257 (1884).

Golungo Alto.—A branched shrub, 8 to 10 ft. high, perhaps a tree; branches sometimes pendulous, sometimes sarmentose-scandent, flexuous, nodes tumid; leaves coriaceous, glossy, brittle; unripe berries green. In rather elevated secondary woods, sprung up after cultivation of the land, in Sobato Quilombo-Quiacatubia; fr. Feb. 1855. Also an evergreen tree of moderatesize, in Mata de Quisuculo, 8 Sept. 1855. No. **357**.

Island of St. Thomas.—A tree. In rather elevated mixed

primitive mountainous forest; young fr. end of Dec. 1860. Native name "Branco" or "Pau branco" (white wood). No. **358**.

24. **CLAOXYLON** Adr. Juss.; Benth. & Hook. f. Gen. Pl. iii. p. 309.

1. **C. Welwitschianum** Muell. arg. in Journ. Bot. ii. p. 333 (1864), and in DC. Prodr. xv. 2, p. 776 (1866).

Golungo Alto.—A slender tree, 10 to 15 ft. high, or rarely 20 ft.; trunk scarcely 3 in. in diameter; branches almost horizontally patent; branchlets with cartilaginous scales at the base; flowers dicœcious, greenish. In the primitive forests of Serra de Alto Queta, sporadic; fl.-bud beginning of Nov. 1855, male fl. Dec. 1855 and Jan. 1856, unripe and nearly ripe fr. Jan. and Feb. 1856. No. **398**. Arillode of the seeds bright scarlet, viscid. Among the Queta mountains, promiscuously with male individuals; female fl. Dec. 1855, fr. Feb. 1856. No. **398***b*. A tree, 12 to 15 ft. high; head widely spreading; branches patent, whitish; leaves membranous; fruit geminately dicoccous; arillode scarlet. On the slopes of rather dense forests towards the river Zenza, on the right bank; fr. March 1856. No. **397**.

2. **C. angolense** Muell. arg. in Journ. Bot., *l.c.*, p. 333, and in DC., *l.c.*, p. 777.

Pungo Andongo.—A shrub, 3 to 4 ft. high, with several stems. In rocky rather poor thickets near Luxillo, not plentiful; female fl. and fr. Feb. 1857. No. **399**.

3. **C. pauciflorum** Muell. arg. in Journ. Bot., *l.c.*, p. 333, and in DC., *l.c.*, p. 778.

Loanda.—A shrublet, 2 to 3 ft. high, much branched from the base; stems oblique or ascending; branches whitish bay; leaf-buds and floral bracts cartilaginous, bay-coloured, rounded, concave; leaves membranous, herbaceous-green, drying blackish green like some Urticaceæ; flowers dicœcious; male flowers greenish; fruit pendulous on slender pedicels, didymous; endocarp somewhat fleshy, scarlet. In somewhat dry sandy hilly places, in short grass among other shrubs, near Museque de S. Flores above Loanda to the south-west; fl. Feb., fr. April 1854. No. **400**.

4. **C. Trichogyne** Muell. arg. in Journ. Bot., *l.c.*, p. 334, and in DC., *l.c.*, p. 778.

Golungo Alto.—A virgately branched shrub, 4 to 5 ft. high; bark whitish; stipules cartilaginous. By fences in fields after the burning of the forest, near Sange, rather rare; fr. June 1855. No. **396**.

5. **C. triste** Muell. arg. in Journ. Bot., *l.c.*, p. 334, and in DC., *l.c.*, p. 779.

Huilla.—A shrublet, 1½ to 3 ft. high, branched from the base; branches erect; leaves herbaceous-green, somewhat limp, thinly fleshy, 2 to 4 together proceeding from a cartilaginous sheath, shortly petiolate; flowers apparently dicœcious; fruit mostly twin, that is, dicoccous, rarely monococcous by the abortion of one of the cocci, as large as a peppercorn; cocci green, bivalvular, monospermous; seed perfectly spherical, enclosed in a very bright scarlet arillode. In rocky thickets at an elevation of 5000 ft., near Humpata, rather rare; fr. Dec. 1859. No. **390**. A melancholy shrublet, 2 to 3 ft. high, with erect little trunks. In rocky elevated thickets in Morro de Lopollo; without fl. or fr. end of Jan. 1860. No. **391**.

6. **C. occidentale** Muell. arg. in Flora, 1864, p. 438, and in DC., *l.c.*, p. 779.

Island of St. Thomas.—In primitive forest at an elevation from 1800 to 2000 ft., on Monte Caffé; scarcely in fl. Dec. 1860. No. **442**.

7. **C. Mercurialis** Thwaites, Enum. Pl. Zeylan. p. 271 (1861); Muell. arg., *l.c.*, p. 790.

Tragia Mercurialis L. Sp. Pl. edit. 1, p. 980. *Micrococca Mercurialis* Benth. in Hook. Niger Fl. p. 503 (1849).

Golungo Alto.—An annual or biennial herb, with the habit of *Mercurialis annua* L., customarily erect, rarely procumbent. In sandy places flooded in the summer rainy season and in moist neglected places of cultivation, in Sobato Cabanga-Cacalungo; fl. and fr. Jan. and Feb. 1855. No. **394**.

Pungo Andongo.—An annual herb, when in the flowering state nearly always damaged by insects. In gravelly places at the base of Pedra Cabondo; fl. and fr. Jan. 1857. No. **395**.

25. **ACALYPHA** Royen, L.; Benth. & Hook. f. Gen. Pl. iii. p. 311.

1. **A. paniculata** Miq. Fl. Ind. Bat. i. 2, p. 406 (1859); Muell. arg. in DC. Prodr. xv. 2, p. 802 (1866).

Ricinocarpus villosus, δ. *racemosus* O. Kuntze, Rev. Gen. Pl. ii. p. 616 (1891).

Golungo Alto.—A sparingly branched herb, 2 to 4 ft. high, with an Urticaceous habit. At the outskirts of forests, among bushes and tall herbs, near Sange and Bango, tolerably plentiful; fl. and fr. Feb. 1855. Also in fields near Sange; fl. and fr. Jan. 1855. No. **420**.

2. **A. fuscescens** Muell. arg. in DC., *l.c.*, p. 821, n. 52.

A. dumetorum Muell. arg. in Journ. Bot. ii. p. 334 (1864) as to specimen Welw. n. 430 only. *Ricinocarpus fuscescens* O. Kuntze, *l.c.*, p. 618.

Pungo Andongo.—A herb, 1 to 1½ ft. high; rootstock thick, woody, polycephalous; stems numerous, erect or oblique; leaves loosely pilose, deep green above, paler beneath; among bushes and scattered herbs near Caghuy in the præsidium; fl. Feb. 1857. No. **430**.

3. **A. dumetorum** Muell. arg. in Journ. Bot., *l.c.*, p. 334, partly, and in DC., *l.c.*, p. 821, n. 53.

Ricinocarpus dumetorum O. Kuntze, *l.c.*, p. 617.

Huilla.—An erect, sparingly branched undershrub, 2 to 4 ft. high; branches virgate, leafy towards the apex. In rather dense craggy thickets between Nene and Lopollo; fl. and fr. end of Oct. and beginning of Nov. 1859. Also in rocky places near Mumpulla; Oct. 1859. No. **432**. An erect, sparingly branched undershrub, 2 to 3 ft. high; stigmas brilliantly reddish. At the outskirts of the forest at Monino, among tall herbs, rather rare; fl. Dec. 1859. No. **431**.

4. **A. ornata** Hochst. in Pl. Schimp. Abyss. ii. n. 1414 (*U.i.*, 1842), and iii. n. 1647 (*U.i.*, 1844); A. Rich. Fl. Abyss. ii. p. 247 (1851); Muell. arg. in DC., *l.c.*, p. 833.

Ricinocarpus ornatus O. Kuntze, *l.c.*, p. 618.

Var. **glandulosa** Muell. arg. in Linnæa, xxxiv. p. 19 (1865), and in DC., *l.c.*

Golungo Alto.—An erect undershrub, 2 to 4 ft. high, sparingly and patently branched towards the apex; female flowers sometimes above, sometimes below the male flowers. In moist thickets near Trombeta; fl. Sept. 1854. No. **439**. A perennial herb or an undershrub or sometimes a shrub, 2 to 4 or rarely 5 ft. high, with quite the habit of an *Urtica*; stem erect, sparingly branched at the apex; branches spreading, virgate; leaves bright green, patent and nearly pendulous or deflected-pendulous while others are fasciculately erect. Male flowers below, reddish, with 8 to 6 white anthers; filaments of the stamens hyaline, flattened, transversely and very closely septate, somehow elastic; the stamens on the opening of the perianth are slowly elongated by the extension of the septa and spread upon the limb of the perianth in the form of a star, but at the slightest touch they spring against the centre of the flower, and therefore just reversely to the case of *Pilea* in which on the centre of the flower being touched the stamens spring against the circumference. Female flowers congregated in blood-red comose spikes. At the outskirts of thickets in moist shady places nearly throughout the district, plentiful, flowering and fruiting from October to March; near Sange, N-delle, Fundo Cacarambola, and in Mata de Quibanga in Sobato Mussengue; fl. Dec. 1855 and March 1856. No. **438**.

Pungo Andongo.—A patently branched undershrub of 3 ft. high or a shrub 4 to 6 ft. high; flowers greenish, unisexual, the male flowers on the upper part of the plant. In rocky places at the outskirts of forests in the præsidium, sporadic; fl. Jan. 1857. No. **437**.

5. **A. Welwitschiana** Muell. arg. in Journ. Bot., *l.c.*, p. 334, and in DC., *l.c.*, p. 834.

Ricinocarpus Welwitschianus O. Kuntze, *l.c.*, p. 618.

Pungo Andongo.—A shrub, 3 to 5 ft. high, branched sparingly and only at the apex. At the outskirts of forests among tall herbs, near Luxillo; fl. Jan. and Feb. 1857. No. **433**.

6. **A. angolensis** Muell. arg. *ll.cc.*, pp. 335, 835.

Ricinocarpus angolensis O. Kuntze, *l.c.*, p. 617.

Pungo Andongo.—An erect, sparingly branched undershrub, 4 ft. high. In thickets at the outskirts of the forest near Catete in the præsidium; female fl. Feb. 1857. No. **434**.

7. **A. polymorpha** Muell. arg. in Journ. Bot., *l.c.*, p. 335, and in DC., *l.c.*, p. 835.

Ricinocarpus polymorphus O. Kuntze, *l.c.*, p. 618.

α, **elliptica** Muell. arg., *ll.cc.*

Huilla.—In hilly sandy-schistose sparingly bushy places covered with sand, near Lopollo, in company with species of Thymelæaceæ (cf. *Gnidia Hoepfneriana* Gilg.; Welw. herb. no. 6479) and Irideæ; fl. and fr. Nov. 1859. No. **429**.

β, **sericea** Muell. arg., *ll.cc.*

Huilla.—In rather dry rocky thicket near Mumpulla, sparingly; fl. Oct. 1859. Only one specimen preserved. No. **421**.

γ, **oblongifolia** Muell. arg., *ll.cc.*, pp. 335, 836.

Huilla.—In pastures decked with species of *Clematis* (cf. *C. chrysocarpa* Welw. herb. no. 1222) and Thymelæaceæ (cf. *Gnidia Rendlei*; Welw. herb. no. 6478), among low bushes, between Lopollo and Ferrão da Sola, very sparingly; fl. Nov. 1859. No. **428**.

δ, **angustifolia** Muell. arg., *ll.cc.*, pp. 335, 836.

Huilla.—In rocky pastures, among low herbs, between Mumpulla and Humpata, at an elevation from 4000 to 4200 ft.; fl. end of Oct. 1859. No. **422**. In somewhat rocky pastures, among low bushes, between Mumpulla and Nene; fl. Oct. and Nov. 1859. No. **423**.

ε, **depauperata** Muell. arg., *ll.cc.*, pp. 335, 836.

Huilla.—A herb, 5 to 9 in. high; rootstock thick, woody, polycephalous; stems cæspitose, erect, but little branched; flowers monœcious; anthers red. In somewhat dry rocky pastures or thickets, among low bushes, about Lopollo, plentiful; fl. end of Oct. and beginning of Nov. 1859. No. **424**.

8. **A. benguelensis** Muell. arg. in Journ. Bot., *l.c.*, p. 335, and in DC., *l.c.*, p. 844.

Ricinocarpus benguelensis O. Kuntze, *l.c.*, p. 617.

α, **Trichogyne** Muell. arg., *ll.cc.*

Huilla.—A perennial herb, 1 to 1½ ft. high; stems erect, shortly branched at the base. In herbaceous wooded places at Monino near Lopollo not abundant; fl. and fr. Dec. 1859. No. **435**.

β, **Adenogyne** Muell. arg., *ll.cc.*, pp. 336, 844.

Pungo Andongo.—A herb lasting for several years, 6 in. high or more; rootstock thick, woody, polycephalous; stems numerous, ascending, rarely erect, branched at the base; flowers greenish purple; stigmas purple. In sandy thickets between the præsidium and the river Cuanza, plentiful; fl. and unripe fr. Feb. 1857. Also in bushy rough and gravelly places near Pungo Andongo; fl. Dec. 1856. No. **436**.

9. **A. indica** L. Sp. Pl. edit. 1, p. 1003 (1753); Muell. arg. in DC., *l.c.*, p. 868.

Ricinocarpus indicus O. Kuntze, *l.c.*, p. 618.

Loanda.—An annual herb, somewhat woody at the base, with a disagreeable mouse-like smell; sap watery; flowers monœcious, the male ones clustered in spikes, the female ones 2 or 3 together seated at the base on the conduplicate bracts of the involucre; styles penicillately multifid; capsules tricoccous. On the sparingly herbaceous slopes of Praia de Bispo near Loanda; fr. 11 May 1858. No. **417**.

Bumbo.—In neglected fields, after cultivation of *Arachis hypogæa* L., near Bumbo at the base of Serra da Xella, 15° S. Lat.; about 2000 ft. alt., sparingly; one specimen in fl. and fr. Oct. 1859. No. **427**.

10. **A. brachystachya** Hornem. Hort. Hafn. p. 909 (1815); Muell. arg. in DC., *l.c.*, p. 870.

Ricinocarpus brachystachyus O. Kuntze, *l.c.*, p. 617.

Pungo Andongo.—An annual, slender herb, with an Urticaceous habit. In moist places neglected after cultivation near the præsidium; fl. and fr. Dec. 1856. No. **393**.

11. **A. Vahliana** Muell. arg. in Linnæa xxxiv. p. 43 (1865), and in DC., *l.c.*, p. 873.

A. ciliata Vahl, Symb. Bot. i. p. 77. t. 20 (1790); non Forsk. (1775). *Ricinocarpus Vahlianus* O. Kuntze, *l.c.*, p. 618.

Golungo Alto.—In neglected plots of cultivation throughout the district, plentiful, especially near Sange and Camilungo; fl. and fr. Feb. 1855. No. **419**.

Pungo Andongo.—In a kitchen garden in the præsidium: fl. and fr. end of Jan. 1857. No. **418**.

12. **A. segetalis** Muell. arg. in Journ. Bot., *l.c.*, p. 336, and in DC., *l.c.*, p. 877.

Ricinocarpus segetalis O. Kuntze, *l.c.*, p. 618.

Golungo Alto.—In somewhat shady places among low herbs at the banks of the river Cuango near Sange; fl. June 1856. No. **440**. In neglected fields after crops of *Arachis hypogæa* L., near Sange, only one specimen; fl. and fr. Sept. 1855. No. **389**. Among crops of *Arachis hypogæa* L., plentiful, especially near Camilungo; fl. and fr. Jan., March, and May 1855. No. **416**.

Ambaca.—An annual herb; the principal stem erect, the lower ones ascending. Among plantations of *Phaseolus* and *Arachis hypogæa* L., nearly throughout the district; near Ambaca, fl. and fr. Sept. 1856. No. **416***b*.

26. **ALCHORNEA** Swartz; Benth. & Hook. f. Gen. Pl. iii. p. 314.

1. **A. floribunda** Muell. arg. in Flora, 1864, p. 435, and in DC. Prodr. xv. 2, p. 905 (1866).

β, **glabrata** Muell. arg. in Journ. Bot. ii. p. 336 (1864), and in DC., *l.c.*

Pungo Andongo.—A shrub, 7 to 9 ft. high, perhaps arborescent: stem and branches elongated, slender, purple; male and female flowers very bright red-scarlet; style elongated, erect: capsules 3- or rarely 4-coccous. In the dense forest close to the cataract of Mata de Cabondo, rather rare; fl. and fr. Feb. 1857. No. **352**.

2. **A. cordata** Benth. in Hook. Niger Fl. p. 507 (1849); non Muell. arg. (1866).

Schousbœa cordifolia Schum. & Thonn. in Danske Vidensk. Selsk. iv. p. 223 (1829). *A. cordifolia* Muell. arg. in Linnæa, xxxiv. p. 170 (1865), and in DC., *l.c.*, p. 908; Ficalho, Pl. Uteis, p. 257 (1884).

Golungo Alto.—An arborescent shrub 8 to 12 ft. high or a small tree of 10 to 15 ft., sometimes standing erect, in other cases subscandent with long virgate sarmentose branches; leaves coriaceous, shining, glandular at the base of the nerves; flowers dicœcious, paniculate, yellowish; panicles mostly springing from the trunk or older branches, drooping-pendulous; fruit elongated-didymous; seeds wrapped in a scarlet arillode. In damp places by wooded thickets and close to streams throughout the district, plentiful; at the rivulet Quiapoze near Sange; nearly ripe fr. end of Nov. 1855, and female fl. Sept. 1856; about Sange and Bango, fl. and fr. Aug. and Oct. 1855 and Aug. 1856; Terras de Bumba, fl. beginning of Aug. 1856. Native name "Dunce" or "Bunce." A black dye is prepared by the negroes by baking this plant mixed with the mud of a stream. No. **379**. The Lichen n. 261 grew on the leaves of this plant at the stream Quiapoze near Sange in March 1855.

Prince's Island.—A shrub, 5 to 7 ft. high, with numerous stems at the base. In sandy seaside thickets near Bahia de S. Antonio: unripe fr. Sept. 1853. No. **378**.

Island of St. Thomas.—In gravelly places by streams among the mountains, also in the coast region; young fr. end of Dec. 1860. Native name "Bugi-Bugi." No. **377**.

The name "Bugi-Bugi" is also used in St. Thomas for *Claoxylon Molleri* Pax. The name "Dunce" is used in Pungo Andongo for *Lepidoturus occidentalis* Muell. arg.

27. **LEPIDOTURUS** Baill.; Benth. & Hook. f. Gen. Pl. iii. p. 316; non Bojer.

1. **L. occidentalis** Muell. arg. in Journ. Bot. ii. p. 332 (1864), and in DC. Prodr. xv. 2, p. 898 (1866).

Pungo Andongo.—A shrub as tall as a man, perhaps a young tree; leaves membranous, very bright green, remarkable for a long linear obtuse acumen. In wooded places near Luxillo; a few specimens in fr. March 1857. No. **407**. A slender tree, 10 to 15 ft. high; trunk straight, scarcely an inch in diameter, divaricately branched at the apex; head lax; branchlets slender; leaves membranous. In damp bushy places near Catete; without expanded fl., a few specimens with male fl.-buds May 1857. No. **407***b*. A shrub nearly as tall as a man; stems numerous, virgate; leaves membranous, caducous at the time of the flowering; spikes of flowers yellowish-reddish. In damp thickets near Catete in the præsidium; nearly leafless, with young male fl. end of May 1857. No. **408**.

The natives in this district call the plant "Dunce"; it has the general appearance of a birch tree, and is likewise used for dyeing black. The Fungus n. 500 grew on the leaves of a climbing deciduous shrub of this Family, probably this species, at Barranco de Catete in May 1857. According to a ms. note of Welwitsch the name "Dunce" is also used for *Acridocarpus* (*Sphedamnocarpus*).

28. **NEOBOUTONIA** Muell. arg.; Benth. & Hook. f. Gen. Pl. iii. p. 317.

1. **N. africana** Muell. arg. in Journ. Bot. ii. p. 336 (1864), and in DC. Prodr. xv. 2, p. 892 (1866); Benth. in Hook. Ic. Pl. xiii. p. 77, tt. 1298-1299 (1879).

Golungo Alto.—A tree, 15 to 20 ft. high; trunk 8 in. in diameter, bare of branches to the height of 6 to 8 ft., then branched; branches patent, long, curved-ascending; male flowers white. In the primitive forests of Serra de Alto Queta, rather rare; male fl. Dec. 1854. No. **359**. A shrub 6 to 9 ft. high, perhaps a young tree. In thickets on Mount Cungulungulo near Montalegre; female fl. Feb. 1855. No. **359***b*.

29. **MALLOTUS** Lour.; Benth. & Hook f. Gen. Pl. iii. p. 319.

1. **M. oppositifolius** Muell. arg. in Linnæa, xxxiv. p. 194 (1865), and in DC. Prodr. xv. 2, p. 976 (1866).

Croton oppositifolius Geiseler, Croton. Monogr. p. 23 (1807). *Acalypha? dentata* Schum. & Thonn. in Danske Vidensk. Selsk. iv. p. 184 (1829). *Claoxylon cordifolium* Benth. in Hook. Niger Fl. p. 506 (1849). *Rottlera dentata* Baill. Adansonia i. p. 69, partly (1860).

a. **genuinus** Muell. arg., *ll.cc.*

Golungo Alto.—A slender, much-branched, subscandent shrub,

4 to 5 ft. high; bark beautifully purple; branchlets elongated, variously curved, pendulous or ascending; flowers whitish; fruit tricoccous. In dense wooded elevated thickets at the Capopa spring near Sange; fl. and fr. April and May 1855, and Feb. 1856. Also a tree-like form, near Undelle; fr. June 1855. No. **342**.

30. **MACARANGA** P. Thouars; Benth. & Hook. f. Gen. Pl. iii. p. 320.

1. **M. heterophylla** Muell. arg. in DC. Prodr. xv. 2, p. 993 (1866). *Mappa heterophylla* Muell. arg. in Journ. Bot. ii. p. 336 (1864). *Tanarius heterophyllus* O. Kuntze, Rev. Gen. Pl. ii. p. 620 (1891).

Sierra Leone.—An arborescent shrub; branches patent, almost drooping-scandent; leaves some not lobed, others 3- to 5-lobed, gland-dotted beneath. In the elevated forests of Sugar Loaf Mountain, near Freetown; scarcely in good fl. Sept. 1853. No. **464**.

2. **M. angolensis** Muell. arg. in DC., *l.c.*, p. 994; Ficalho, Pl. Uteis, p. 257 (1884). *Mappa angolensis* Muell. arg. in Journ. Bot., *l.c.*, p. 337. *Tanarius angolensis* O. Kuntze, *l.c.*, p. 620.

Golungo Alto.—A robust arborescent shrub, 6 to 8 ft. high and more, subscandent among other shrubs with long sarmentose branches or sometimes standing quite erect, with a menispermaceous habit (cf. *Jateorhiza strigosa* Miers); trunk 1 to 1½ in. in diameter, spiny; leaves hard and dryly coriaceous, deep green and somewhat shining above, not lobed or 3- or 5-lobed, the young ones sometimes densely ferruginous-tomentose; petiole auriculate-stipulate at the base; flowers dicœcious, the female ones yellowish dusky; fruit spherical, very densely clothed with small golden-coloured glands. In dense wooded thickets close to streams in the ascent from Sange towards Sobato de Bumba, female fl. 7 and 14 July and in Aug. and Oct. 1855, fr. Oct. 1855. No. **449**. A shrub, 4 to 7 ft. high, not milky; the older stems clothed with long distant spines, the younger ones unarmed; branches patent, much elongated, sarmentose, widely climbing; leaves rigid, glandular at the insertion of the petiole, sometimes sub-entire, in other cases on the same branch 3- or 5-lobed, smooth and somewhat glossy above, marked beneath with transverse arched veinlets; leaf-lobes abruptly acuminate; flowers dicœcious, the male ones very densely crowded on a bractlike receptacle; stamens apparently 2. Fruit drupaceous, spherical, as large as a small pea or a seed of *Vicia Cracca* L., very densely covered with very small viscid golden-coloured hyaline granules. In rather dense very shady primitive forests in Serra de Alto Queta, avoiding places once cultivated and afterwards in secondary woods; male fl. middle of Aug. 1856. No. **450**. The negro name of the shrub is "Dibala."

The following specimens of large foliage appear to belong to this genus, and perhaps to this species:—

Ambriz, etc.—Leaf (in one case) trifid, excised and mucronulate at the apex, 7-nerved and deeply cordate at the base, 17 in. long by 16 in. broad, puberulous along the veins; tertiary veins arching; petioles 12 to 18 in. long, with large glands at the extremity. In the interior mountainous wooded parts of the district, for example, at Bembe, about 130 miles from Ambriz, whence the leaves and a fragment of the stem were received by Welwitsch, having been sent by his friend Monteiro. The sap of the stem and petioles is watery and somewhat viscid. No. **451**. Leaves without their petioles (one leaf only preserved)

found in the market at Ambriz, having been used for wrapping up Jinguba, that is, seeds of *Arachis hypogœa*, etc., for transport from the interior; Nov. 1853. According to the negroes who brought the goods to market, the leaves grew on a tree or bush called "mugi," or "muchi" (these words signify a tree) which occurs in interior elevated forests. No **451***b*. Leaves used as wrappers for Jinguba seeds, which the negroes carry from the interior of Angola to the markets of the seacoast, towns, etc., and which belong apparently to a large tree, called by the Bunda negroes "Dibala." In damp forests on the north-east confines of the district of Pungo Andongo, in the Ginga kingdom; leaves seen in Sept. 1857. No. **451***c*. A tree, apparently small; trunk straight, beset with crowded slender horizontally spreading spines; bark whitish grey; leaves alternate, in the young state enclosed in large stipules; the blade cordate-ovate, angular, with incumbent basal lobes, narrowed and more or less emarginate-bifid at the apex, about 18 in. long and broad; petioles 1 to 1½ ft. long; the trunk and branches abounding in a limpid gummy sap. In damp interior forests, collected by Monteiro, received in 1858. No. **451***d*. In Sept. 1857, in Golungo Alto, Welwitsch met five or six hundred negroes carrying to Loanda among other goods packages of Jinguba wrapped up in these gigantic leaves from the most interior districts, such as Hungo and Duque de Bragança. No. **451***e*.

3. **M. monandra** Muell. arg. in Journ. Bot., *l.c.*, p. 337, and in DC., *l.c.*, p. 1012.

Tanarius monandrus O. Kuntze, *l.c.*, p. 620.

Golungo Alto.—A much-branched, erect tree, 8 to 25 ft. high; head broad, frondose; trunk slender, densely beset below with obtuse quasi-truncate spines, reddish or purplish; branches spreading; bark reddish; habit almost of *Myrsineæ*; leaves densely gland-dotted beneath, deciduous at the time of the flowering; petiole long, bright blood-red-purple, often bent near the apex; flowers apparently dicœcious, the female ones greenish, the male ones sought for in vain; fruit drupaceous, pea-shaped, the unripe ones green, lepidote with dusky golden-coloured scales. In the dense rather elevated primitive forests of Serra de Alto Queta, not plentiful; fl.-buds end of Oct. 1854; female fl. Jan. end of June and July 1855; young fr. Feb. 1856; also at Zengas do Queta, March 1855; and in secondary woods of the central Queta, Zengas, end of July 1856. No. **446**.

4. **M. spinosa** Muell. arg. in Flora, 1864, p. 466, and in DC, *l.c.*, p. 1013.

Tanarius spinosus O. Kuntze, *l.c.*, p. 620.

Golungo Alto.—A tree, 8 to 15 ft. high; trunk slender, scarcely 2 in. in diameter, dusky red, beset with distant or dense straight patent spines; branches and branchlets virgate-elongated, very patent, almost reflected-ascending; the lower part of the trunk completely covered with thorns about ½ to ¾ in. long. In secondary woods at the banks of the river Cuango, at Arimo do Mariano, rather rare, fl.-bud Feb. 1856; also on wooded slopes on the right bank of the same river, young fr. Dec. 1855. No. **447**. A small tree 6 to 8 ft. high, probably a young or mutilated tree; the erect trunk and the spreading branches and even the smallest branchlets spiny throughout; leaves membranous, somewhat glossy; petioles rosy. In wooded places among the mountains of the central Queta, at Zengas do Queta; without fl. or fr. June 1856. No. **448**. A little tree 4 ft. high, probably a young tree; trunk

spiny, as thick as a man's finger ; branches scattered, spinulose ; leaves membranous ; petioles long, rosy purple. In the forest among the mountains of Serra de Alto Queta, very rare ! without fl. or fr. June 1856. No. **448***b*.

31. **RICINUS** Tournef., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 321.

1. **R. communis** L. Sp. Pl. edit. i. p. 1007 (1753); J. A. Schmidt, Fl. Cap Verd Ins. p. 307 (1852); Welw. Apontam. p. 564, sub n. 153 (1859); Muell. arg. in DC. Prodr. xv. 2, p. 1017 (1866); Ficalho, Pl. Uteis, p. 258 (1884).

Var. **megalospermus** Muell. arg., *l.c.*, p. 1017.

b. **pruinosus** Muell. arg., *l.c.*, p. 1017.

Mossamedes.—By the banks of the river Bengo, at Boca do Rio, in gravelly places, very plentiful, forming little woods, 8 to 12 or rarely 15 ft. high ; fl. and fr. July 1859. No. **305**. Seeds sent in 1861, perhaps belonging to this form. Coll. Carp. 924.

Var. **benguelensis** Muell. arg. in Journ. Bot. ii. p. 337 (1864), and in DC., *l.c.*, p. 1019.

Loanda and Mossamedes.—A bush, 6 to 8 ft. high, herbaceous throughout ; nearly all parts of the plant, even the fruit and seeds, spread with a very delicate glaucous powder : seeds half the size of the typical form. Cultivated at Mossamedes near dwellings as a medicinal plant and called "Bafureira" (oil plant) ; the leaves are applied to women's breasts to excite or increase the flow of milk ; fl. and fr. beginning of Aug. 1859. In gardens near Loanda and also at Mossamedes as an introduction from the Cape de Verde Islands, June 1860. No. **307**.

Cape de Verde Islands.—Island of S. Thiago ; seeds, Jan. 1861. Coll. Carp. 923.

Var. **genuinus** Muell. arg. in DC., *l.c.*, p. 1019.

c. **macrophyllus** Muell. arg. in DC., *l.c.*, p. 1020.

Loanda.—By fences in neglected fields and cultivated by villages, everywhere ; at Boa Vista, fl. Aug. 1854. No. **306**.

Golungo Alto.—An undershrub or very rarely a small tree. By negro villages and in neglected plots of cultivation, everywhere, perhaps native ; at Bango, fl. and young fr. Feb. 1855. The oil from the seeds is extensively used by the negroes as a purgative. No. **304**.

32. **PYCNOCOMA** Benth. ; Benth. & Hook. f. Gen. Pl. iii. p. 326.

1. **P. dentata** Hiern, sp. n.

A small or young tree, 10 to 12 ft. high, glabrate except the tips and inflorescence ; branches pallid or ashy, subterete, divaricate, patent-ascending or variously bent, leafy towards and especially at the rather thick apex ; leaves alternate, oblanceolate or elliptic-oblong, rounded or more or less narrowed at the apex, more or less wedgeshaped at the base, thinly and firmly coriaceous, delicately penniveined and reticulate, entire except towards the dentate-serrate upper part of the margins, 3 to 7 in. long by $\frac{3}{4}$ to 2 in. broad, rather shining and nearly the same in colour on both faces ; petioles $\frac{1}{8}$ to $\frac{1}{4}$ in. long ; stipules caducous ; flowers diœcious ; the male flowers crowded in compact cylindrical-oblong strobiliform

catkins in the axils of the upper leaves ; catkins of the unexpanded flowers about $\frac{1}{2}$ in. long by $\frac{1}{4}$ in. thick ; bracts broadly ovate, rounded, about $\frac{1}{7}$ in. long and rather broader, very concave, imbricate, appressedly hairy on the exposed part of the back, glabrous inside, exceeding and including the flower-buds ; flower-bud about $\frac{1}{10}$ in. long and $\frac{1}{8}$ in. broad, angular, somewhat flattened on the side next the axis of the catkin and curved on the other side, sessile, each within a bract of the catkin; calyx triphyllous, the segments thick, somewhat similar to the bracts but smaller, hairy on both faces, unequal, valvate in æstivation, enclosing the bunch of stamens, one or two of them obtusely keeled on the back ; stamens very numerous, very densely crowded, seated on the fleshy torus, glabrous ; filaments free, rather thickly filiform, somewhat flexuous, erect or ascending, firm ; anthers 2-celled, short, apparently versatile; the cells dehiscing longitudinally, subseparated by the connective ; ovary 0. Female plant not seen.

Ambriz.—In small woods between Ambriz and Quizembo, at an elevation of 100 to 150 ft. ; young male fl. Nov. 1853. No. **476**.

This is probably the plant referred to in Welwitsch's diary on Nov. 8, 1853, at Ambriz, as a small tree, with the habit almost of a *Pittosporum*.

33. **TRAGIA** Plum., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 329.

1. **T. volubilis** L. Sp. Pl., edit. 1, p. 980 (1753) ; Muell. arg. in DC. Prodr. xv. 2, p. 935 (1866).

Var. **genuina** Muell. arg., *l.c.*, p. 936.

Golungo Alto.—An undershrub, woody at the base, climbing very long distances through thickets, armed with strongly stinging hairs ; sap watery ; leaves somewhat fleshy ; bracts of the racemes of male flowers deep blood-red ; cocci of the capsules sometimes spheroidal, sometimes compressedly triangular. In the forests of Sobato Mussengue near Menha Lula, climbing among the denser thickets ; fl. and fr. Nov. 1855. No. **382**.

2. **T. angolensis** Muell. arg. in Journ. Bot. ii. p. 333 (1864), and in DC., *l.c.*, p. 940.

Pungo Andongo.—A perennial herb, a foot high ; rootstock woody, polycephalous ; stems numerous, branched from the base ; branches elongated ; leaves membranous, somewhat hard, discolorous ; flowers pale yellowish-greenish ; fruit obscurely tricoccous. In dry thickets between Mangue and Candumba ; fl. and fr. March 1857. No. **425**.

Huilla.—Flowers reddish. In pastures by hills among low bushes, near Lopollo, in company with several species of *Gnidia* and many Irideæ, on a schistose sandy soil ; fl. and fr. Dec. 1859. No. **426**. A narrow-leaved form, scarcely differing. No. **426***b*.

3. **T. cordifolia** Benth. in Hook. Niger Fl. p. 501 (1849) ; Muell. arg. in DC., *l.c.*, p. 944 ; Ficalho, Pl. Uteis, p. 259 (1884) ; non *T. cordata* Vahl (1790).

Golungo Alto.—A far and widely climbing herb, the whole plant beset with very vehemently stinging hairs which cause extreme pain often lasting a day ; sap watery. By moist thickets and among rather tall grass about Sange and Banza do Sobato Bango, etc., plentiful ;

fl. and fr. March 1855 and beginning of June 1856. No. **381**. A variety with the bracteoles and flowers green not reddish. At Mussengue together with the typical plant ; fl. Dec. 1855. No. **381***b*.

The negroes call this plant "Risanza," and the Portuguese colonists call it "Casãoção." The failure in rearing horned cattle in Golungo Alto is said to be due principally to the frequent presence of this terrible stinging plant ; Welwitsch, however, doubted this statement ; it probably causes cattle to avoid the pastures in the same way as does *Lepistemon africanum* Oliv. See *ante*, pp. 723, 731.

34. **DALECHAMPIA** Plum., L. ; Benth. & Hook. f. Gen. Pl. iii. p. 330.

1. **D. scandens** L. Sp. Pl. edit. 1, p. 1054 (1753) ; Muell. arg. in DC. Prodr. xv. 2, p. 1244 (1866).

Var. **parvifolia** Muell. arg., *l.c.*, p. 1245.

D. parvifolia Lam. Encycl. Méth. ii. p. 258 (1786). *D. senegalensis* Webb in Hook. Niger Fl. p. 174 (1849) ; J. A. Schmidt, Fl. Cap Verd Ins. p. 305 (1852). *Dalechampia* sp., Welw. in Ann. Cons. Ultramar. Lisb. No. 24 (May 1856), p. 250, n. 127.

Ambriz.—Widely climbing. At the banks of the river Quizembo ; fl. and fr. Nov. 1853. No. **387**.

Loanda.—Closely resembling a *Convolvulus* in habit and mode of growth ; perennial. By thickets near Loanda, rather rare ; March 1854. No specimens preserved. Coll. Carp. 925. In moist bushy places, widely and densely climbing among shrubs at Represa de Magellães ; fl. and fr. May 1854. No. **383**.

Libongo.—A twining herb, with a Convolvulaceous habit, hoary-pubescent throughout ; branchlets mostly very intricate, in the young state as well as the new leaves silky-hoary ; flowers greenish. In moist thickets at the banks of the river Lifune, near Banza de Libongo ; fl. and fr. Sept. 1858. No. **385**.

Var. **cordofana** Muell. arg., *l.c.*

D. tripartita R. Br. in Salt, Abyssinia, App. lxv. (1814), name only. *D. cordofana* Hochst. in Pl. Nub. Kotsch. n. 84 (*U. i.*, 1841), and ex A. Rich. Fl. Abyss. ii. p. 244 (1851).

Loanda.—A twining, widely climbing herb, apparently annual, resembling an *Ipomœa* in habit ; leaves deep green, somewhat glabrous but thinly pilose not tomentose ; involucres subglabrous, not tomentose, from green to yellowish, 7- to 9-nerved. In herbaceous thickets, between Penedo and Conceiçao, not uncommon ; fl. and fr. Nov. 1858. No. **384**.

Cazengo.—A twining, widely climbing, strongly stinging herb, beset with vehemently irritating hairs ; involucres and flowers from green to yellowish. By thickets close to the banks of the river Luinha, near Aguas doces, plentiful ; fl. and fr. June 1855. No. **388**.

Mossamedes.—At the bushy banks of the river Bero near Mossamedes, rather rare ; fr. July 1859. No. **386**.

35. **MAPROUNEA** Aubl.; Benth. & Hook. f. Gen. Pl. iii. p. 333.

1. **M. africana** Muell. arg. in DC. Prodr. xv. 2, p. 1191 (1866).

Bumbo.—A tree 15 ft. high, loosely branched, with the habit almost of a *Pyrus*, sparingly milky ; fruiting trees, occurring in the neighbourhood of other trees, with male spikes. In the forests of the more

elevated part of Serra de Xella ; nearly ripe fr. and leaves and rather young spikes, Oct. 1859. No. **401**. A slender tree, 15 to 20 ft. high, almost leafless when in flower (only a few branchlets then bearing young leaves), branches patent. In primitive forests in Serra de Xella, at an elevation from 3200 to 3800 ft., sporadic ; male fl. Oct. 1859. No. **401***b*.

36. **SAPIUM** P. Browne; Benth. & Hook. f. Gen. Pl. iii. p. 334.

1. **S. Mannianum.**

Excœcaria Manniana Muell. arg. in Flora, 1864, p. 433, and in DC. Prodr. xv. 2, p. 1217 (1866).

Cazengo.—A moderate-sized or small tree scarcely 15 ft. high, densely frondose, strongly milky ; leaves rigidly coriaceous, green and very glossy above ; flowers monœcious, yellow-greenish. In rough hilly places among tall bushes, on the left bank of the river Luinha, near Aguas doces ; fl. and unripe fr. June 1855. No. **380**.

Golungo Alto.—A tree, 15 to 25 ft. high; trunk a foot in diameter at the base ; primary branches erect-patent, the others very patent ; leaves evergreen, coriaceous, glossy, biglandular at the base. At the outskirts of primitive forests near Catomba in the Eastern Queta, fl. and unripe fr. July 1856 ; also in the Alto Queta forests, unripe fr. Aug. 1856. No. **376**.

I follow Benth. & Hook. f., *l.c.*, p. 335, in placing this tree in the genus *Sapium*.

37. **EXCŒCARIA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 337.

1. **E. oblongifolia** Muell. arg. in Journ. Bot. ii. p. 337 (Nov. 1864), and in DC. Prodr. xv. 2, p. 1214 (1866) (*Excœcaria*).

Pungo Andongo.—An undershrub, 1⅓ ft. high. In sandy thickets near Luxillo ; only one specimen in fr., all the others had been burnt up, Feb. 1857. No. **375**. A shrublet, 1½ to 2 ft. high ; stems numerous from a woody rootstock, ascending, purple ; leaves coriaceous ; capsule tricoccous, the cocci with two short spines or appendages on the back. In thickets by roadsides near Luxillo and Cazella, fr. Jan. 1857 ; also in wooded bushy places near Guinga, fr. Feb. 1857. Coll. Carp. 935.

CXVI. URTICACEÆ.

1. **URERA** Gaudich. ; Benth. & Hook. f. Gen. Pl. iii. p. 383.

1. **U. obovata** Benth. in Hook. Niger Fl. p. 515 (1849) ; Weddell in DC. Prodr. xvi. 1, p. 97 (1869).

Var. **Jihefo.**

A shrub, 4 to 6 feet high or more, exuding a very thick watery sap, climbing far and often high, often attached to its host by means of a series of adventitious rootlets thrown out from the stem, either beset more or less copiously with sufficiently stinging hairs or nearly unarmed ; stems in the living state dingy purplish or greenish purple, furrowed, angular, beset with small rough tubercles (the basal remains of the fallen hairs) or nearly smooth, at first straight fleshy and very brittle, afterwards

divided into spreading sarmentose branches; leaves alternate, oval-oblong or broadly oval, cuspidate-acuminate at the apex, obtuse truncate or subcordate at the trinerved base, thick or fleshy-brittle, rigid, not coriaceous, somewhat rough, deep or blackish green and somewhat glossy above, pallid or grey and very delicately lepidote-dotted beneath, entire and slightly undulate on the margin, 2 to 6 in. long by $\frac{3}{4}$ to 3 in. broad, more or less hispid along the basal nerves or nearly glabrous; lateral veins few, usually 1 or 2 on each side in addition to the basal nerves, slender, in relief on the lower face of the leaf; cystoliths on the lower face linear, short, numerous, not conspicuous; petioles ranging up to 2 in. long, beset with strong hairs or nearly unarmed, usually puberulous-pulverulent; stipules triangular-lanceolate, subglabrous, slightly puberulous chiefly along the middle of the back, $\frac{1}{6}$ to $\frac{1}{5}$ in. long, caducous; flowers diœcious, small, greenish-yellowish or greenish-purplish; corymbs green, pedunculate in the axils of the leaves, highly compound, mostly forming nest-like bunches more or less quadrangular flat on the top an inch broad and $\frac{3}{4}$ in. high; common peduncle thick, short, at the top very intricately branched; ultimate pedicels very short. Male perianth deeply 4-cleft, the segments trianglar-ovate, $\frac{1}{16}$ in. long, glabrous inside, puberulous outside, valvate in æstivation, spreading in flower; stamens 4, exserted, spreading, as long as the perianth-lobes opposite to them and inserted about their base; ovary rudimentary, small. Female flowers very small; ovary conical-oblong, green, $\frac{1}{25}$ in. long, unilocular, crowned at the top with the very short style and the ferruginous penicillate stigma, arranged more or less verticillately round the floral axis, closely invested in the perianth. The floral axis, that is, the common stalk of the ultimate ramification of the corymbs, terminates in small thick fusiform pellucid purple glands which have a seta at the tip.

Golungo Alto.—In dense forest close to the river Delamboa, near Sange, seen only there, on the old trunks of Spondieæ, etc.; female fl. middle of April 1856. Local name "Jihefo bastardo." No. **6279**. In primitive forests at the banks of the Quisucula streams, very rare; female fl., May 1856. Negro name "Jihefo" (bravo). No. **6268**.

The tree Jihefo is *Piper guineense* Thonn., Welw. herb. nos. 508 to 510 and Coll. Carp. 940.

Pungo Andongo.—In the Cabondo wooded thickets, in the præsidium; male fl. Jan. 1857. No. **6294**.

The last No. is a shorter plant than the others, with the branches nearly unarmed, but it is probably a younger state of the same species.

Compare with this species *U. Thonneri* De Wild. and Th. Dur. Pl. Thonner. Congol. p. 11, t. 18 (1900).

2. **URTICASTRUM** Heist.; Fabric. Enum. Hort. Helmst. p. 204 (1759).

Laportea Gaudich. (1826); Benth. & Hook. f. Gen. Pl. iii. p. 383.

1. **U. Carruthersianum** Hiern, sp. n.

A shrub, 4 to 6 ft. high; stems dusky red, sparingly branched,

armed all round with crowded straight slender subulate pallid deciduous spreading excessively stinging prickles articulated at or near the small tubercular dusky base; branches similarly armed, rather thick, erect-patent, leafy at the apex; leaves alternate, deciduous, flat, crowded at the apex of the stems and branches, broadly ovate-cordiform, ample, subpellate-cordate, acutely pointed or shortly acuminate at the apex, membranous, dentate, beset more or less especially beneath with stinging hairs and with shorter hispid hairs, deep green above, paler and white-arachnoid or with interwoven whitish setose hairs beneath, 5-nerved at the base, ranging up to a foot long by $\frac{5}{6}$ ft. broad, sometimes slightly sinuate-lobulate in general outline; teeth ovate-deltoid, apiculate, about equalling their sinuses, $\frac{1}{8}$ to $\frac{3}{8}$ in. long, $\frac{1}{8}$ to $\frac{1}{2}$ in. broad at the base; lateral veins about 4 or 5 on each side of the midrib exclusive of the basal nerves; cystoliths punctiform; petioles rather thick, beset with spreading or downward directed stinging hairs, ranging up to $\frac{1}{4}$ ft. long, inserted at the emargination formed by the overlapping sides of the leaf-base about a fifth way above the base of the blade; stipules triangular-lanceolate, $\frac{1}{3}$ to $\frac{2}{5}$ in. long; flowers monœcious, greenish, small, corymbosely paniculate, on the lower part of the stem at the axils of fallen leaves; panicles $1\frac{1}{2}$ to 3 in. long, branched from the base; the branches spreading, more or less flattened or narrowly winged, beset with stinging hairs; ultimate pedicels very short. Male flowers about $\frac{1}{12}$ in. in diameter, depresso-spheroidal in the bud, valvate in æstivation; perianth unequally 4-partite, the segments oblong ovate or broader than long; stamens 4, opposite the perianth-segments, the filaments more or less dilated or thickened and adhering to the lower part of the inner face of the perianth segments; ovary small, rudimentary. Female flowers about $\frac{1}{16}$ in. long, ovoid; perianth 3-partite, the segments ovate and unequal; staminodes 0; ovary glabrous, obliquely ovoid, $\frac{1}{4}$ in. long, minutely scrobiculate; style very short, sublateral.

Golungo Alto.—In primitive forests by streams; at the Delamboa, fl. March 1856. No. 6267.

This plant is named in honour of my friend Mr. William Carruthers, F.R.S., one of the executors acting under Welwitsch's will; it was through his representations, when Keeper of the National Herbarium, that the Trustees of the British Museum undertook the publication of this Catalogue.

3. **FLEURYA** Gaudich.; Benth. & Hook. f. Gen. Pl. iii. p. 382.

1. **F. æstuans** Gaudich. in Freyc. Bot. Voy. Uran. p. 496 (1826); Wedd. in DC. Prodr. xvi. 1, p. 71 (1869).

Urtica æstuans L. Sp. Pl., edit. 2, p. 1397 (1763).

Golungo Alto.—A bright green herb, 1 to $1\frac{1}{2}$ ft. high; stem weak, the lower parts with sparse or scarcely any leaves. In damp fields neglected after crops of *Arachis hypogæa* L. on the right bank of the river Cuango, plentiful but only in a few places; fl. and fr. Nov. 1855. No. 6261.

2. **F. grossa** Wedd. in Ann. Sc. Nat., Ser. 4, i. p. 183 (1854), and in DC., *l.c.*, p. 76.

Urtica grossa E. Meyer ex Drège in Flora 1843, Bes. Beig. 2, pp. 136, 148, 150, 228.

Pungo Andongo.—An annual herb, erect or ascending at the base, very violently stinging. On a rich soil in rocky places near Catete; fl. Feb. 1857. No. **6273**. An erect herb, annual, 3 to 5 ft. high, armed with very vehemently stinging bristles; flowers monœcious, greenish, the female ones on the upper part of the stem. In somewhat shady primitive woods in Mata de Pungo, growing in masses; fl. and unripe fr. 14 April, 1857. No. **6295**.

3. **F. podocarpa** Wedd. in DC., *l.c.*, p. 76.

Var. **fulminans**.

A marshy stoloniferous herb, probably lasting throughout the year, 1 to 5 ft. high, sometimes almost an undershrub, of two different forms in respect of the inflorescence, more or less pilose with violently stinging hairs; stolons epigamous and hypogamous; sap watery; hairs of the stem whitish, bent down and adpressed; leaves alternate, ovate or deltoid-ovate, acuminate at the apex, subtruncate or somewhat wedge-shaped at the trinerved base, penniveined, membranous, reticulate, more or less pilose, dentate, deep green above, paler beneath, 2 to 4 in. long by $1\frac{1}{4}$ to $2\frac{1}{2}$ in. broad; basal lateral nerves slender, erect-patent, reaching the margin about the middle of the side of the blade; penniveins alternate, slender, 5 or 6 on each side in addition to the basal nerves; reticulation delicate, cystoliths linear on the lower face, not conspicuous, rather punctiform on the upper face; teeth more or less obtuse, minutely apiculate; petioles rosy, ranging up to $3\frac{1}{2}$ in. long; stipules lanceolate or filiform from a broader base, $\frac{1}{5}$ to $\frac{1}{2}$ in. long; flowers monœcious; the male ones racemose-spicate on fleshy rosy or purplish limp erect-spreading or ascending peduncles, sometimes in clustered panicles developed on a naked scape which proceeds from the rhizome, sometimes cymose-paniculate in the axils of the leafy stem, fulminating on touch, scape sometimes 2 to $2\frac{3}{4}$ ft. long; peduncles of the male inflorescence 1 to 12 in. long, more or less pilose, the inflorescence $\frac{1}{2}$ to $10\frac{1}{2}$ in. long, the clusters of flowers $\frac{1}{5}$ to $\frac{2}{5}$ in. in diameter, subsessile or on short pedicels, the ultimate pedicels very short; the male perianth usually 5-partite, rarely 4-partite; the segments equal, ovate-oblong, concave, uninerved, valvate in æstivation, $\frac{1}{12}$ in. long, whitish green, rosy outside, sparingly setose; stamens usually 5, rarely 4, whitish, transversely furrowed, elastic; anthers white, before the opening of the flower surrounded with the articulate-hyaline filaments resembling the annulus of ferns, exploding the pollen in an elastic manner with a momentary development of heat; ovary globose, rudimentary; female flowers several together, sessile, in very loosely racemose clusters, on closely reflected peduncles which are almost adpressed to the stem; style long, rosy, terminating in the truncate stigma; fruit often produced underground, compressed, obliquely elliptical,

rather obtusely pointed at both ends, glabrous, $\frac{1}{6}$ in. long, $\frac{1}{12}$ in. broad; fruiting perianth $\frac{1}{8}$ in. long, unequally 4-partite; the segments oval; seed $\frac{1}{10}$ in. long; embryo $\frac{1}{12}$ in. long; fruiting pedicels very slender, $\frac{1}{4}$ to $\frac{1}{2}$ in. long.

Golungo Alto.—In damp places by streams, abundant, flowering in November and February; at the river Cuango, fl. Feb. 1855. Nos. **6266, 6296.** In especially shady places at the rivulets of Mata de Quisuculo; fl. and unripe fr. 28 April, 1856. No. **6265.**

When the flowers explode they produce, by means of an electric discharge, a sense of burning when touched by the hand (Welw. ms.). I have not seen the female flowers. The fibre of the plant is slender and tenacious.

This plant should be compared with the var. *amphicarpa* Engl. Pfl. Ost.-Afr. C, p. 163 (1895), a specimen of which variety I have not seen, but which is given by Engler, *l.c.*, as occurring in the Angola and Lower Congo district. No. 6296 in Herb. Kew. is *Girardinia adoënsis* Wedd.

4. **GIRARDINIA** Gaudich.; Benth. & Hook. f. Gen. Pl. iii. p. 384.

1. **G. adoensis** Wedd. in Ann. Sc. Nat., ser. 4, i. p. 181 (1854).

Urtica adoënsis Hochst. in Pl. Schimp. Abyss. i. n. 101 (*U. i.*, 1840); Steud. in Flora xxxiii. p. 259 (1850); A. Rich. Fl. Abyss. ii. p. 262 (1851). *Girardinia* sp., Wedd. in Ann. Sc. Nat. ser. 3, xviii. p. 203 in note (1852). *G. condensata* Wedd. Monogr. Urtic. p. 169, t. 2, fig. B (1856), partly; and in DC. Prodr. xvi. 1. p. 103 (1869), partly.

Huilla.—A stinging herb, 3 to 4 ft. high, sparingly branched. In shady places by streams near Monino, at the base of the Morro; fl. and fr. Jan. 1860. No. **6289.**

No. 6296 in Herb. Kew. (not that No. in the study set), is this species. The same plant was collected by Capello, n. 92, in Feb. 1878, on the way from Caconda to Bihé in Angola, and there it is rather common; the native name is "Lunhi."

5. **ADICEA** Rafin. Analyse de la Nature, p. 179 (1815).

Pilea Lindl. Collect. t. 4 (1821); Benth. & Hook. f. Gen. Pl. iii. p. 384.

1. **A. tetraphylla** O. Kuntze, Rev. Gen. Pl. ii. p. 623 (1891).

Urtica sp., Pl. Schimp. Abyss. i. n. 74 (*U. i.*, 1840). *U. quadrifolia* Hochst. in Pl. Schimp. Abyss. iii. n. 1680 (*U. i.*, 1844). *U. tetraphylla* Steud, in Flora xxxiii. p. 260 (1850). *Pilea quadrifolia* A. Rich. Fl. Abyss. ii. p. 263 (1851); Wedd. Monogr. Urtic. p. 199, t. 7, fig. 4-10 (1856); Hook. f. in Journ. Linn. Soc. vii. p. 216 (1864). *P. tetraphylla* Blume Mus. Bot. Lugd.-Bat. ii. p. 50 (1856); Wedd. in DC. Prodr. xvi. 1, p. 136 (1869).

Var. **angolensis.**

A slender, erect, intensely green, annual herblet, 4 to 6 in. high, with the habit altogether of an *Urtica*, somewhat rigid in the living state, but quickly becoming quite limp, glabrous and unarmed in most parts but sometimes with a few straight rigid long setæ

on the upper part of the stem and on the lower face of the upper leaves; stems simple or but little branched; leaves scarcely whorled in fours at the top of the plant, opposite, ovate, obtusely narrowed at the sub-apiculate apex, very obtusely narrowed at the trinerved base, membranous, the upper pairs dentate and ranging up to an inch long by $\frac{2}{3}$ in. broad, the lower pairs entire and ranging up to $\frac{1}{2}$ in. long by $\frac{3}{8}$ in. broad; lateral veins few, weak; cystoliths linear; petioles ranging to $\frac{2}{3}$ in. long, slender; lower internodes long, the upper ones short; inflorescence short, axillary; flowers clustered.

Pungo Andongo.—In moist shady rocky parts of Barrancos da Pedra Songue in the præsidium; fl. Feb. and May 1857. No. 6258.

The two following Nos. perhaps belong here:—

Pungo Andongo.—On the shady rocks of Pedras de Guinga; fl. Jan. 1857. Branched, 3 to 5 in. high. No. 6259. A branched, apparently annual herb, about a foot high; in fl. No. 6272.

"N-sasi" or "N-sagi," plural "Jinsasi," and "Cachinde quiansagi" or "Caxinde iansasi" are native names of a species of this genus.

2. **A. Mooreana** Hiern, sp. n.

A weak, slender, erect or ascending annual herb, 4 to 12 in. high; stem simple, pallid, glabrate and naked below, above leafy and furnished with sparse spreading narrowly subulate whitish setæ; leaves opposite, deltoid-ovate, acuminate at the apex, very obtuse or sub-truncate and often emarginate at the trinerved base, membranous, herbaceous-green above, sub-glaucous-green beneath, not conspicuously hairy but with the hairs thinly scattered or chiefly on the ribs and veins, coarsely dentate except the base, $1\frac{1}{2}$ to 2 in. long by 1 to $1\frac{3}{4}$ in. broad, the radical ones about 3 in. long and broad; lateral veins two or three on each side of the midrib in addition to the basal nerves, slender; teeth sub-deltoid, $\frac{1}{8}$ to $\frac{3}{8}$ in. long, apiculate: cystoliths on the blade punctiform; petiole rather slender, $\frac{1}{2}$ to 1 in. long, glabrous, marked with oblong or sublinear cystoliths, that of the radical leaves about 3 in. long and sparingly setose; stipules lanceolate or oval-oblong, acute or caudate-acuminate, concave, somewhat hairy on the back, glabrous inside, ciliolate, $\frac{1}{8}$ in. long; flowers diœcious, the female ones very small, with an unequally trifid green perianth, without staminodes, few or several together, sessile, in small pedunculate clusters; common peduncle $\frac{1}{3}$ to $\frac{2}{3}$ in. long, solitary in the axils of the middle or lower leaves of the stem, glabrous, marked with sublinear cystoliths; capsule compressed, obliquely oval or ovate-rotund, pallid, $\frac{1}{20}$ in. long, scrobiculate, marked at or near the apex with the short obliquely placed style and at the base with the free small persistent oblique perianth.

Pungo Andongo.—In fr. No. 6276. In Mata de Pungo; without fl. or fr. Jan. 1857. No. 6256.

This species is named in honour of my friend Mr. Spencer Le Marchant Moore, F.L.S., who in the *Journal of Botany* for 1880 elaborated Welwitsch's Acanthaceæ.

6. **ELATOSTEMA** J. R. & G. Forster; Benth. & Hook. f. Gen. Pl. iii. p. 386.

1. **E. sessile** J. R. & G. Forst. Char. Gen. p. 106 (1776); Wedd. in DC. Prodr. xvi. 1, p. 172 (1869).

Golungo Alto.—In the damp very shady parts of primitive forests at the Delamboa stream; fl. June 1856. No. **6269**. An annual herb; sap watery; stems succulent; leaves blackish green and shining above, paler beneath, somewhat rigid in the living state; flowers clustered, seated on bracteate somewhat fleshy usually quadrangular and shortly pedunculate receptacles. In especially shady places by streams near Cacarambola; fl. beginning of July 1855. No. **6270**.

Our specimens are not quite like the type from Tahiti; though the plant is described by Welwitsch as annual, the stems sometimes throw out adventitious roots near the base; the leaves (including the acumen) are strongly serrate-dentate, 1 to $4\frac{1}{2}$ in. long by $\frac{1}{3}$ to $1\frac{2}{3}$ in. broad, acutely acuminate, more or less conspicuously marked with linear cystoliths, and glabrous except the midrib and principal veins beneath. I prefer to consider them as representing a variety of the above variable species, but on the scale of species as treated by Weddell it might be regarded as new. Cf. Henriques, Bol. Soc. Brot. x. p. 163 (1893), where our plant (no. 6269) is said to be identical with a supposed new species from the island of St. Thomas.

7. **POUZOLZIA** Gaudich.; Benth. & Hook. f. Gen. Pl. iii. p. 387.

1. **P. procridioides** Wedd. Monogr. Urtic. p. 412 (1856), and in DC. Prodr. xvi. 1, p. 231 (1869).

Urtica procridiodes E. Mey. ex Drège in Flora 1843, ii. Bes. Beigabe, pp. 150, 151, 228. *Margarocarpus procridioides* Wedd. in Ann. Sc. Nat., ser. 4, i. p. 204 (1854). *Böhmeria* (Margarocarpus) *procridioides* Blume, Mus. Bot. Lugd.-Bat. ii. p. 204 (1856).

Bumbo.—A herb with the habit of a *Parietaria*. In marshy bushy places near Bumbo, sporadic; fl. and fr. Oct. 1859. No. **6278**.

This differs from the type of the species by the presence of trimerous and triandrous male flowers in company with tetramerous and tetrandrous ones.

2. **P. andongensis** Hiern, sp. n.

An erect, annual herb, 2 to 3 ft. high, growing in dense masses; stems very tenacious, simple naked and glabrescent below, sparingly branched leafy and hispid-pubescent above, as well as the branches densely leafy at the apex; leaves mostly alternate, ovate or elliptical-ovate, acuminate at the apex, more or less wedgeshaped at the trinerved base, submembranous, deep green and with pallid adpressed scattered hairs above, whitish and more or less arachnoid beneath, entire, 2 to $3\frac{2}{3}$ in. long by 1 to $2\frac{1}{4}$ in. broad; lateral veins about two on each side of the midrib in addition to the basal nerves, in relief on the lower face of the blade, impressed on the upper face; cystoliths punctiform; petioles hispid-pilose, ranging up to $2\frac{1}{3}$ in. long; stipules ovate-lanceolate, acuminate-caudate, glumaceous, uninerved, hispid along the back, ciliate, $\frac{3}{5}$ to $\frac{1}{2}$ in. long; lateral or axillary

abbreviated shoots with small leaves resembling foliaceous stipules; flowers in short axillary or lateral clusters, androgynous or dicœcious, several together, on the upper part of the stem or branches; male perianth 4-cleft, $\frac{1}{12}$ in. in diameter; the lobes ovate, thinly pilose on the back, ciliate; stamens 4, glabrous, around a rudimentary ovary; female perianth 4-cleft, thinly pilose on the back, $\frac{1}{20}$ in. long, investing the ovary; staminodes 0; fruit ovoid, shining, $\frac{1}{12}$ in. long.

Pungo Andongo.—By streams in the præsidium, near Cazella, fl. and fr. Feb. 1857. No. **6271**. In bushy rocky parts of the præsidium, plentiful; female fl. Feb. and March 1857. No. **6260**.

A textile plant. On No. 6260 grew *Cuscuta blepharolepis* Welw. herb. no. 6140, *ante* p. 743.

3. **P. golungensis** Hiern, sp. n.

An erect or ascending, slender, annual herb, 2 to 3 ft. high; stem rosy purple, simple naked and glabrescent below, branched and more or less pilose above; branches ascending, pilose-pubescent, leafy; leaves alternate, ovate or lanceolate, acuminate at the apex, sub-truncate rounded or more or less narrowed at the base, submembranous, limp, deep green and with scattered pallid pilose hairs above, whitish and more or less cottony beneath, trinerved at the base, entire, $\frac{3}{4}$ to 2 in. long by $\frac{1}{6}$ to $\frac{3}{4}$ in. broad; only one pair of lateral veins in addition to the basal nerves, in relief on the lower face of the blade, impressed on the upper face; cystoliths punctiform; petioles pilose, ranging up to $\frac{3}{8}$ in. long; stipules lanceolate, acuminate-caudate, glumaceous, pilose on the back, ciliate, $\frac{1}{12}$ to $\frac{1}{8}$ in. long; flowers dicœcious, the female ones greenish, axillary; perianth $\frac{1}{15}$ in. long, ovoid-conical, costate, somewhat hairy outside, closely investing the ovary and young similarly shaped glabrous fruit.

Golungo Alto.—In thinly wooded places at the Capopa stream, very sparingly; female fl. and fr. end of May 1856. No. **6277**.

Habit of *P. guineensis* Benth. in Hook. Niger Fl. p. 518.

4. **P. huillensis** Hiern, sp. n.

Apparently a perennial shrubby herb, about 3 ft. high, branched at least above; branches purplish brown, glabrescent; branchlets alternate, somewhat tawny or brown, pubescent, leafy; leaves alternate, ovate or oval, more or less acuminate at the apex, rounded or very obtuse at the base, firmly membranous, deep green and with scattered pallid adpressed hairs above, paler and more or less whitish-cottony beneath, triplinerved near the base, entire, $1\frac{1}{2}$ to 3 in. long by $\frac{3}{4}$ to 2 in. broad; lateral veins about two on each side of the midrib in addition to the sub-basal nerves, in relief on the lower face of the blade, impressed on the upper face; cystoliths punctiform; petioles hispid-pilose, ranging up to nearly an inch long; stipules lanceolate, acuminate-caudate, glumaceous, pilose on the back, ciliate, $\frac{1}{5}$ to $\frac{1}{3}$ in. long; flowers dicœcious, the male ones clustered several together in the axils, subsessile; male perianth depressedly spheroidal in the bud,

valvate in æstivation, 4-cleft, hairy outside, $\frac{1}{10}$ in. in diameter; the lobes deltoid-ovate, apiculate; stamens 4, glabrous; filaments inserted near the internal base to the perianth opposite its lobes; anthers inflected in the bud, afterwards exserted; ovary glabrous, small, ellipsoidal-oblong, rudimentary.

Huilla.—In shady forest at Catumba, in rocky places close to the stream, rare and seen nowhere else; male fl. Feb. 1860. No. **6290**.

Related to *P. guineensis* Benth.; but the leaves are larger, whitish-cottony beneath and triplinerved.

8. **PARIETARIA** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 392.

1. **P. officinalis** L. Sp. Pl., edit. 1, p. 1052 (1753); Weddell in DC. Prodr. xvi. 1, p. 235[42] (1869).

Cf. *P. maderensis* Reichenb. in Flora xiii., pp. 131, 380 (1830); Lowe in Hook. Journ. Bot. i. p. 31. (1834).

Island of Madeira.—In fl. and fr. Aug. 1853. No. **6274**.

9. **FORSKOHLEA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 393.

1. **F. viridis** Ehrenb. ex Desfont. Cat. Hort. Paris, edit. 3, p. 347 (*Forskahlea*) (1829); Weddell in DC. Prodr. xvi. 1, p. 235[56] (1869).

Chamædryfolia viridis O. Kuntze, Rev. Gen. Pl. ii. p. 625 (1891).

Mossamedes.—An annual, erect herb, from a palm to a foot high, patently branched from the base upwards, with whitish to greenish flowers. In rocky shady parts of Santo Antonio; fl. and fr. 21 July 1859. No. **6291**. An erect, herbaceous-green or intensely green, annual herb, branched from the base to the apex, 1 to 3 ft. high, with the habit of *Mercurialis*, *Parietaria*, or *Urtica*, with flowers clustered in small heads. In neglected plots of cultivation near Cavalheiros; fl. July 1859. No. **6292**.

CXVII. MORACEÆ.

1. **CANNABIS** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 357.

1. **C. sativa** L. Sp. Pl., edit. 1, p. 1027 (1753); Welw. Apontam. p. 547 sub n. 71 (1859), and Synopse Explic. p. 45, n. 125 (1862); Alph. DC. Prodr. xvi. 1, p. 30 (1869); Monteiro, Angola, ii. p. 256 (1875); Ficalho, Pl. Uteis, p. 261 (1884); Engl. Mon. Morac. African. p. 44 (1898).

Sierra Leone.—Without fl. or fr. No. **6275***d*.

Golungo Alto.—Cultivated by the negroes almost everywhere but always in small quantities; at Sange, fl. Jan. 1855. Negro name "Riamba." No. **6275**.

Pungo Andongo.—In fl. and fr. No. **6275***c*.

Huilla.—Cultivated by some of the natives in concealed places. Native name "Riambe." The dried specimens were given to the Lisbon Medical School. No. **6275***b*.

Among the Maraoes "Bangue" is the name of this plant when dried and prepared for smoking; in the Congo district it is called "Riambe," in Loanda, etc., "Riambá," also sometimes pronounced "Riámba"; in Golungo "Diambe," and among the Mahungos and

Gingos "Liambe"; the Portuguese name is "Canhamo." This commodity, which is for the most part if not wholly composed of the cut-up leaves of hemp, is eagerly sought for in the markets by the natives at Loanda and in all the interior of Angola for narcotic smoking; indulgence in it constitutes one of the most pernicious of their vices, especially with the slaves, who when addicted to Riamba smoking become nearly useless to their owners. The plant is cultivated in all the interior districts of Angola, but always in situations more or less retired or lonely, in order to withdraw the plantations from the notice and greed of passengers. Hæmorrhage of the nose is the very frequent consequence of this smoking intoxicant; the natives in the interior of Huilla are accustomed to cure it with the powdered panicles of "Encotahote" (*Cymbopogon schœnanthus* Spr. var. *styptieus* Rendle; Welw. herb. n. 7526, Coll. Carp. 1093 and 1094), an application of which nearly always has the desired effect.

For an account of the constituents of hemp resin, see a paper by T. H. Easterfield and T. B. Wood in Proc. Cambr. Phil. Soc. ix. 3, pp. 144-8 (1896); and on its pharmacological action, by C. R. Marshall, *l.c.*, pp. 149–50.

The dried herb is packed for sale in cylindrical sausage-shaped parcels, 2 to 3 ft. long and about 4 in. thick. The fruits of the *Adansonia*, called "Mûcua," are used by the negroes for smoking the Riamba; see *ante*, p. 80.

2. **MYRIANTHUS** P. Beauv. Fl. Owar. pp. xi, 16, t. 11, excl. fr., non t. 12 (1804); Benth. & Hook. f. Gen. Pl. iii. p. 379.

1. **M. arboreus** P. Beauv., *l.c.*, p. 17; Ficalho, Pl. Uteis, p. 273 (1884); Engl. Mon. Morac. African. p. 37. t. 16 (1898).

Golungo Alto.—A very elegant tree, 20 to 25 ft. high, mostly diœcious but not rarely monœcious in different branches of the same tree; trunk $1\frac{1}{4}$ to 2 in. in diameter at the base, branched a little above the base; branches spreading; sap of the branchlets watery, viscid, scarcely turning white, but the trunk when cut with a knife showed no sap; leaves digitate; syncarpium resembling both in its shape and golden colour a pineapple or some species of *Pandanus*, its flesh edible, acidulous-sweet; seeds numerous in the syncarpium. In the dense rather damp primitive forests close to streams about Sange and in the Alto Queta and Cungulungulo mountains, plentiful; male and female fl. Nov. and Dec. 1855; fr. Dec. 1855. Native name "Musibiri," "Musuviri," or "Musubiri." No. **2590** and Coll. Carp. 901.

Pungo Andongo.—A form with obtuse leaflets and more slender male inflorescence. In the denser forests of Mata de Pungo; male fl. March 1857. No. **2591**.

The Lichens, nn. 109, 119, 151, 167, 168, 171, 183, 331, 375, 376, 467, grew on the trunk or branches of this tree in Golungo Alto; also the moss n. 213 (*Racopilum* sp.) and the hepatic n. 316 on the bark, in the same district. In Pungo Andongo it is also called "Pernambuco."

3. **MUSANGA** R. Br. in Tuckey, Congo, pp. 453, 328, 329, 467 (1818); Benth. & Hook. f. Gen. Pl. iii. p. 379.

1. **M. cecropioides** Br. ex Tedlie in Bowdich, Miss. Ashantee, p. 372 (1819).

M. Smithii R. Br. in Benn. & Br. Pl. Javan. Horsfield, p. 49 (1838); Benth. in Hook. Ic. Pl. xiv. p. 4. tt. 1306, 1307 (April 1880); Ficalho, Pl. Uteis, p. 273 (1884); Engl. Mon. Morac.

African. p. 42, c. fig. p. 43 and t. 18 (1898); non Benth. in Hook. Niger Fl. p. 519 (1849).

Island of St. Thomas.—A very elegant tree, 12 to 15 ft. high, branched a little above the base, with a broad head and good wood suitable for house-building; leaves digitate; leaflets 6, 1 to 1½ ft. long; common petiole more than 7 in. long. In the more elevated forests of the island, on Monte Caffé, 1000 to 2800 ft. alt.; some leaves contributed by Senhor Carvalho; without fl. or fr. Dec. 1860. In habit like *Myrianthus arboreus* P. Beauv., but the leaflets are quite entire instead of strongly serrate. Native name "Gofé." No. **2592.**

According to Tedlie, *l.c.*, the hairy sheath or stipule of this large palmate-leaved tree resembles a skin, is boiled in soup, and used as a powerful emmenagogue; in Ashantee it is called "Oeduema."

M. Smithii Benth. in Niger Fl., *l.c.*, is *Macaranga heterophylla* Muell. arg., *ante*, p. 981; the type of *M. Smithii*, which was collected by Christian Smith on the Lower Congo, and also that of *M. cecropioides*, are in the National Herbarium.

4. **FICUS** Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 367.

Some species of figs are especially rich in a thick glutinous milk, which is used by the negroes in the preparation of a bird-lime, called Molemba ordinaria; other species, such as *F. Quibeba*, supply a tough and firm wood, useful for the manufacture of domestic articles; and some, such as *F. trichophylla* and *F. psilopoga*, belong to the most stately trees of western tropical Africa, both on account of their large-leaved and widely extended heads with brick-red branches, as well as for the abundance of their peach-coloured figs, with which they are laden twice a year, and which are tolerably juicy, somewhat sweet and used by several colonists for the extraction of a very excellent spirit tasting like a superior gin. Welwitsch considered that enterprising men with the necessary knowledge and a moderate amount of capital might, in consequence of the great fruitfulness and frequent occurrence of the trees, make this a profitable branch of industry. Other fig trees again have aërial roots, which are coloured red during the rainy season, and which hang down from the branches to the extent often of 10 to 12 ft. and produce an exceedingly strange appearance enhanced considerably by the presence of their innumerable cherry-like figs.

Many other species grow as parasites, either rising clear from the branches of some other tree, or, embracing the tree with its stem pressed flat like a covering, sooner or later kills it, and then the fig tree, previously often only a half open tube, closes at the top and starts with an entire stem its independent existence.

The leaves of *F. exasperata* Vahl, are used for polishing purposes.

1. **F. pseudo-elastica** Welw. ms. in herb., sp. n.

A tree, 20 to 25 ft. higher and more, producing an elastic gum; head very broad; branches rambling, patent; branchlets smooth, glabrescent, towards the apex puberulous, rather thick, leafy; leaves alternate, entire or somewhat sinuous-repand, ovate-oblong, obtusely and shortly cuspidate at the apex, rounded or subcordate

at the somewhat unequal base, 3- or 5-nerved at or near the base, coriaceous, somewhat glossy and deep green above, paler beneath, smooth, glabrous or nearly so, 4 to 7 in. long by 2 to $3\frac{1}{4}$ in. broad; principal lateral veins about 10 to 12 on each side in addition to the basal nerves, slender; reticulation minute; interspaces minutely scaly-papillose; petioles robust, shortly pubescent, $1\frac{1}{2}$ to $2\frac{1}{4}$ in. long; stipules caducous, broad-based, apparently rather small; receptacles axillary, subsessile, subglobose, about $\frac{3}{4}$ in. in diameter, shortly pubescent, solitary or two together, the one examined containing male flowers and barren female ones; basal bracts puberulous on the back, united into a small shortly cleft cup; ostiole small; male flowers with a hyaline unequally 3- to 5-partite or -cleft perianth; stamen solitary, the filaments united below to an abortive pistillode; barren female flowers with a short hyaline 4- or 5-cleft perianth or similar to that of the male flowers.

Bumbo.—In the more elevated forests of Serra da Xella (Chão da Xella); male fl. and unripe fr. Oct. 1859. No. **6365**.

This belongs to the section Palæomorphe of King.

The following No. should be compared with this species, but I have not had the opportunity of examining the structure of the receptacle:—

Golungo Alto.—A strongly lactescent tree of moderate size; branches spreading, also nearly horizontal; branchlets smooth, glabrous; leaves alternate, oval or broadly ovate, entire or slightly sinuous-repand, very shortly and obtusely or abruptly acuminate at the apex, broadly and unequally or slightly hollowed at the 5-nerved base, coriaceous, smooth, glabrous, glaucescent-green above, light green beneath, 9 to 11 in. long by $5\frac{1}{4}$ to 7 in. broad; principal lateral veins 6 to 12 on each side in addition to the basal nerves, in clear relief beneath; tertiary and net-veins close, in relief beneath; interspaces minutely scaly-pulverulent beneath, minutely pitted above; petioles stout, smooth, glabrous or puberulous, $2\frac{1}{4}$ to $3\frac{2}{3}$ in. long; receptacles large, the size of a pigeon's egg, $1\frac{1}{3}$ in. long by $\frac{5}{6}$ in. thick, ellipsoidal, puberulous, subsessile, dusky, laterally bracteate at the base. In shady forests around Bango, Quilombo, and Canguerasange, not uncommon; also on sunny declivities; fr. Nov. 1854. No. **6398**.

The fungus n. 74, *Phyllachora repens* Sacc., A. L. Sm. in Journ. Bot. 1898, p. 178, grew on the leaves of a species of *Ficus*, probably this plant, at Sange in Nov. 1854 and July 1856.

The following three Nos. apparently differ in various particulars and by having large stipules; the two last of them were considered by Welwitsch as possibly varieties of his *F. pseudo-elastica*; the foliage and stipules suggest *F. syringifolia* Warb. in Engl. Bot. Jahrb. xx. p. 170 (1894), non *F. syringæfolia* Kunth and Bouché Ind. Som. Berol. (1846) p. 35, but the lateral veins of the leaves are rather more numerous:—

A glabrous, parasitical tree, 30 to 50 ft. high; trunk dimorphous, the young ones flattened and confluent with the mother plant, the older ones cylindrical and emancipated from the matrix, patently branched, suddenly becoming round and thick and then

assuming the form of a tree; branchlets smooth, dark green towards the apex; leaves alternate, entire or slightly sinuous-undulate, ovate, shortly acutely and often abruptly acuminate at the apex, nearly rounded or hollowed at the unequal 5-nerved base, chartaceous, smooth, dark green above, lighter green or paler beneath, $4\frac{1}{2}$ to 9 in. long by 3 to 6 in. broad; lateral veins about 6 to 8 on each side in addition to the basal nerves, spreading at rather a wide angle, anastomosing within the margin, rather slender; tertiary veins patent, not conspicuous; reticulation manifest only beneath, minute; interspaces microscopically scaly-papillose, pallid; petioles $1\frac{1}{4}$ to 4 in. long, smooth; stipules from a broad base lanceolate, acute, 1 to 3 in. long, deciduous but less caducous than in many species of the genus.

Golungo Alto.—In damp forests at cataracts of the river Cuango, rather rare; without fl. or fr. beginning of Aug. 1855. No. **6344**. At Sange, without fl. or fr. April 1855. Nos. **6396**, **6397**.

This species (no. 6344) grows in the same manner as *F. persicifolia* (no. 6337), with the difference that its trunk when it reaches some height separates itself from the mother plant and becomes independent.

2. **F. Welwitschii** Warb. in Engl. Bot. Jahrb. xx. p. 160 (16 Nov. 1894).

Ambriz.—A majestic tree, under which Welwitsch had an audience with the Queen of Ambriz and where her throne was placed; many smaller trees were in the same village of Quibança, near Ambriz; Nov. 1853. Fruit (syncarpium) fusiform, sessile. No. **6355**.

Libongo.—A handsome tree, 50 ft. high, with an ovoid-pyramidal head. In the more elevated Libongo forests; fr. Sept. 1858. No. **6404**.

Zenza do Golungo.—A magnificent lofty tree, 80 to 100 ft. or even 130 ft. high, one of the most beautiful, never seen to throw out aërial roots; trunk always straight, moderately thick; head dense, ovoid-oblong; branches erect-patent, repeatedly divided; leaves cordate-ovate, abruptively attenuate into an acumen; receptacles fusiform, sessile, two together, grey-greenish. On the outskirts of forests by streams, not uncommon; at the river Chiche and among the Mongolo and Calumguembo mountains; fr. beginning of Sept. 1857, and nearly ripe fr. end of Oct. 1854. Also cultivated and reverenced by the negroes. No. **6356**.

Cazengo.—A broadly frondose, lofty tree, of very beautiful aspect; fruit pisiform, puberulous, somewhat tawny, sessile, with small bracts at the base. At the borders of forests near Cacula, by the king's highway which leads towards Cambondo, sporadic; fr. June 1855. No. **6354**.

Pungo Andongo.—A vast tree, 30 to 50 ft. high; trunk 4 ft. in diameter at the base, at the height of 5 to 6 ft. divided into patent branches; leaves very thinly coriaceous, bright green, somewhat glossy and rigid. At the external base of the gigantic rocks of the præsidium, sporadic; for instance, near Caghuy and at the river Casalalé, early fr. end of March 1857. No. **6364**.

This is apparently the *Ficus*, related to *F. religiosa* L., which Welwitsch in Ann. Cons. Ultramar. Lisb. No. 7 (Aug. 1854), p. 80. n. 18, described as a very lofty and beautiful tree with pisiform fruits, occurring at the village of Quibança in the Ambriz district, Dec. 1853.

Var. **berœnsis.**

A beautiful, evergreen tree, 20 to 30 ft. high or of vast size, copiously lactescent, broadly frondose; branches pallid, firm, glabrous, terete; branchlets spreading, furrowed in the dry state, leafy, nodulose, somewhat puberulous towards the extremities; leaves alternate, entire, ovate, very acutely acuminate or cuspidate at the apex, obtusely narrowed truncate or subcordate and often unequal at the base, thinly and rigidly coriaceous, glabrous, pale green especially beneath, sub-glaucescent especially above, somewhat trinerved or unequally 5-nerved at or near the base, minutely punctate, $1\frac{1}{2}$ to $5\frac{1}{2}$ in. long by $\frac{7}{8}$ to $2\frac{1}{8}$ in. broad; venation clearly marked and in relief on both faces; lateral veins about 8 to 10 on each side in addition to the basal nerves, erect-patent, nearly straight for half their length, dividing and anastomosing within the margin; intermediate veinlets shorter; reticulation complex; petioles furrowed, pallid, $\frac{1}{3}$ to $1\frac{1}{2}$ in. long; stipules deciduous; receptacles mostly 2 together, axillary, subsessile or sessile, crowded, pisiform, $\frac{1}{5}$ to $\frac{1}{3}$ in. in diameter, at first almost hyaline and bright rosy, in full maturity purple, obsoletely hairy with short white hairs, bracteate at the base, marked at the apex with the small imbricate-lobulate orifice, but little juicy; bracts small, obtuse, puberulous or glabrescent; male, female, and gall flowers in the same receptacles; male flowers with a solitary stamen; female flowers with an elongated stigma.

Mossamedes.—At the rocky sides of the river Bero; fl. and ripe fr. end of July 1859. No. **6379**. On the gneiss rocks at the banks of the river Bero near Boca do Rio; without fl. or fr. July 1859. No. **6381**.

3. **F. tuberculosa** Welw. ms. in herb, sp. n.

A tree, 20 to 25 ft. high, densely frondose all over and even from a little above the base; trunk nearly a foot in diameter; branches erect-spreading; branchlets patent, sparingly lactescent, leafy towards the apex, minutely papillose-pulverulent, smooth, often with nodular protuberances or abbreviated shoots $\frac{1}{4}$ to $\frac{1}{2}$ in. thick from which the peduncles take their origin; leaves alternate, crowded at the extremities of the branchlets, less crowded below but usually with short internodes, entire, broadly ovate or oval, cuspidate at the apex, obtuse or rounded-truncate at the somewhat unequal 3- to 5-nerved base, glabrous or nearly so, thickly coriaceous in the living state, deep green and somewhat glossy above, paler beneath, 3 to 9 in. long by $1\frac{3}{4}$ to $5\frac{1}{2}$ in. broad; lateral veins about 7 or 8 on each side in addition to the basal nerves, impressed above, acutely prominent yellowish in the living state and turning purple in the dry state beneath, spreading at rather a wide angle, feebly anastomosing within the margin; tertiary veins patent, slender; reticulation minute, impressed; interspaces inconspicuously papillose beneath, punctate above; petioles moderately robust, $\frac{3}{5}$ to $2\frac{3}{4}$ in. long, puberulous or minutely papillose-pulverulent; stipules comparatively small, $\frac{1}{3}$ in. long, from a broad base ovate, abruptly very acute,

deciduous, glabrous; receptacles hemispherical or subglobose or slightly obovoid, an inch in diameter or rather more, often depressed at the apex, 2 to 4 together, very viscid, exuding a vast quantity of milk, subglabrous, wrinkled with small multiform pits, turning greenish yellow when ripe, originating on the two-year-old branches in comparatively large thick fleshy tubercles (almost as large as a small hazel nut) which at first cover them and then after the autumn rains of April and May break open and form the tubercular base around the ripe infructescence; basal bracts 2, opposite, broadly ovate, rarely bipartite; ostiole small, usually sunk in the depression at the apex of the receptacle, with a narrow slit; peduncles $\frac{1}{2}$ to 1 in. long, semi-terete, puberulous with very short almost papilliform hairs; flowers not seen; fruit-perianth trifid; style long; stigma spongy-capitate; fruit elongated-obovoid.

Golungo Alto.—At the outskirts of forests in Sobato de Quilombo, rather rare, ripe fruit, 1 May, 1856; also one specimen found in the convent garden at Bango Aquitamba. No. **6413** and Coll. Carp. 899. No notes. Without fl. or fr. Leaves rather larger, ranging to 10 in. long by $6\frac{1}{4}$ in. broad, cordate at the base, and about 10 lateral veins on each side in addition to the basal ones. Perhaps this species. No. **6423**.

Var.? **elliptica.**

Leaves elliptical, acuminate-cuspidate at the apex, obtusely contracted to a rounded trinerved base, shortly pubescent along the midrib and about 10 pairs of lateral veins beneath, 4 to 6 in. long by $1\frac{2}{3}$ to $2\frac{1}{3}$ in. broad.

Pungo Andongo.—A tree, 12 to 15 ft. high; trunk 4 to 6 in. thick, divaricately branched from the height of 4 or 5 ft.; branches tortuous; leaves thickly coriaceous, glossy; receptacles pyriform-obovoid, 1 to $1\frac{1}{2}$ in. long, greenish, rough with tolerably large white warts. In rugged places by the lower rocks of Pedra Songue, rather rare; young fr. seen but not collected Jan. (or June) 1857, leafy specimens without fl. or fr. collected April 1857. No. **6358**. Perhaps a distinct species.

No. **6350**, without locality or notes, consists of leafy specimens, perhaps of two different species, one of which rather resembles the var. *elliptica*.

4. **F. Quibeba** Welw. ex Ficalho, Pl. Uteis, p. 270 (1884).

Golungo Alto.—A very beautiful tree, 20 to 45 ft. high or rarely 60 to 80 ft., resembling in habit a gigantic Magnolia, strongly lactescent with a white milk, much like *F. elastica* Roxb. but the leaves are not varnished-glossy above nor so glaucous beneath nor is the midrib reddish as in that species; branchlets furrowed, scarred, pubescent and leafy at the apex, not slender; leaves alternate, crowded, entire, obovate-oval or oval-oblong, shortly abruptly and rather obtusely acuminate at the apex, nearly rounded or somewhat wedge-shaped at the base, thickly coriaceous, hard, smooth, glabrous or nearly so above, pubescent beneath with short whitish scarcely conspicuous hairs, subglaucescent-green above, pale-brown beneath, 5 to 14 in. long by 2 to $6\frac{1}{2}$ in. broad, inconspicuously 3- or 5-nerved at or near the base; midrib impressed above, strongly raised and much broader than the lateral veins beneath; lateral veins about 8 to 10 on each side in

addition to the basal nerves, sub-parallel, anastomosing near the margin; net veins intricate, close, in relief beneath; petioles angular, puberulous, 1¼ to 4 in. long, of nearly the same thickness throughout; receptacles very crowded, proceeding from the thicker branches and even from the trunk, obovoid, warted, as large as a pigeon's egg, shortly pedunculate. In dense thickets among the Queta mountains, sporadic; in leaf, without fl. or fr. extant on the specimens, beginning of June 1855. The fruit was seen by Welwitsch. No. **6399**.

Dr. Warburg, *l.c.*, p. 155, regarded this No. as probably a form of *F. Vogelii* (Miq.). The native name is "Quibeba." The lichens nos. 213, 252, 381, grew on the trunks of *F. Quibeba*.

This tree supplies a tough and firm white wood, which is manufactured into bowls and such-like domestic articles; the trunk is straight and usually 4- to 6-gonal as if consisting of 4 to 6 trees grown together (as occurs also in several other specimens of this genus); and the head forms a broad majestic crown. The tree frequently has growing upon its branches plants of *Hariota parasitica* O. Kuntze (*ante*, p. 407), *Loranthus*, and orchids.

5. **F. callescens** Hiern, sp. n.

A small tree, 12 to 20 ft. high, very much branched, evergreen; trunk and branches sparingly or copiously lactescent; branches spreading, dusky or ashy, glabrous, smooth, somewhat angular; branchlets pendulous after the habit of *Salix babylonica* L., clavate-thickened towards the apex, densely clothed with the persistent stipules, leafy; leaves alternate, obversely lanceolate or obovate, cuspidate or spiculate at the apex, wedge-shaped to the unicostate base, very thick, dryly coriaceous, hard, very rigid, glabrous, green glossy smooth and punctate with raised points above, pallid and delicately reticulate beneath, sometimes not lactescent and even in the living state nearly dry, 3 to 7½ in. long by 1 to 2¼ in. broad; principal lateral veins 6 to 10 on each side of the strong midrib, slender, clearly marked beneath, inconspicuous above, spreading; net veins pale, sunk in comparatively broad depressions which are often punctate with raised points; interspaces beneath slightly in relief rather darker and minutely dotted; petioles broad, ⅓ to 1¼ in. long, sometimes not lactescent, smooth, pulverulent with minute dots or glands; stipules ovate, ½ to ¾ in. long, reddish, soon turning brown, very abundant, imbricate, pulverulent-puberulous on the back, delicately pluricostate; receptacles rare, pyriform, hollowed or depressed about the apex, obtusely umbonate, shortly hairy and scrobiculate outside, ¾ to 1¼ in. long, thick-skinned; interior about ⅝ in. long by ½ to ⅝ in. in diameter; basal bracts ⅛ to ⅓ in. long, stipuliform; coat inside somewhat porous or spongy but firm; peduncles ⅝ to 1½ in. long, axillary, solitary; male, female, and neuter flowers in the same receptacle; perianth 4-partite; segments narrow; ovary narrow; style terminal, rather long; stigma bipartite; stamens solitary; filament long, slender; anther short, dusky.

Golungo Alto.—By springs in very dense thickets between the streams Cuango and Quiapoze, rather rare; fr. Nov. 1854. No. **6395**. In dense wooded places at the Quiquele-quele spring near Sange;

without fr. Aug. 1855. No. **6385**. At Quiquele-quele between Sange and Bango Aquitamba ; fl. Aug. 1856. No. **6420**.

The lichen n. 287 grew on the leaves of this species at the spring of Quiquele-quele in August 1855.

This is nearly related to *F. Preussii* Warb. *l.c.*, p. 156, but the leaves in our plant are more regularly wedgeshaped towards the base and are smaller ; their venation is similar.

The following No., with laurel-like foliage, differs from *F. callescens* by having the lateral veins of the leaves much more numerous, etc.

6. A huge tree, 50 to 80 ft. high, full of a thick milk ; head depressedly hemispherical, very broad ; branches spreading, bending sometimes upwards sometimes downwards ; branchlets ashy, smooth, glabrate or inconspicuously pulverulent, curving, rigid, leafy especially towards the apex ; leaves alternate, entire, obovate-oblong, obtusely subcuspidate at the apex, rounded or obtusely wedgeshaped at the inconspicuously 3- or 5-nerved base, coriaceous, hard, smooth, glabrous, very rigid, deep green glossy and with elevated rounded points above, paler beneath, 4 to 7 in. long by $1\frac{1}{4}$ to $2\frac{1}{4}$ in. broad ; midrib thick, prominent beneath ; lateral veins numerous, parallel, patent, slender ; reticulation minute, plainly marked beneath ; interspaces marked beneath with small papillose points ; petioles thick, $\frac{1}{2}$ to $\frac{7}{8}$ in. long, smooth ; stipules deltoid-ovate, glabrous, $\frac{1}{5}$ to $\frac{1}{4}$ in. long, caducous.

Golungo Alto.—In mountainous places in Sobato de Bumba, not plentiful ; without fl. or fr. 22 Oct. 1855. No. **6339**. By the cross road leading to Bango ; without fl. or fr. Sept. 1856. No. **6420***b*.

The fungus n. 75 *Phyllachora repens* Sacc. (cf. A. L. Smith in Journ. Bot. 1898, p. 178), and the lichen n. 285 grew on the leaves of this fig near Sange in May 1855 and Feb. 1856.

7. **F. microcarpa** Vahl, Enum. Pl. ii. p. 188 (1806) ; Thonn. in Danske Vidensk. Selsk. iii. p. 48 (1828) ; Miq. in Annal. Mus. Bot. Lugd.-Bat. iii. p. 288 (1867) ; non L. f.

F. Thonningi Blume, Rumphia ii. p. 17 (1836). *Urostigma Thonningii* Miq. in Hook. Lond. Journ. Bot. vi. p. 557 (1847), vii. t. 13. fig. C (1848), and in Hook. Niger Fl. p. 522 (1849), and Afrik. Vijge-Boom. p. 38 (1849).

Island of St. Thomas.—Without receptacles, Dec. 1860. Called "Mussanda." The bark supplies a dye. No. **6405**.

The leafy branches agree well with a specimen with fruit in the National Herbarium collected at the Cape Coast by Brass, which appears to belong to this species, but I have not seen a type specimen.

The following five Nos. may be compared with this species, but some at least of them are apparently distinct.

Zenza do Golungo.—A shrub. On a rock near Tanderachique ; without receptacles, Sept 1857. No. **6400**.

This is probably the *Ficus* mentioned by Welwitsch in his diary 27 Aug. to 7 Sept. 1857, as a bush with a widely spreading head thickly coriaceous leaves and pendulous or reflected fruit, occurring at Tanderaxique, but very rare.

Golungo Alto.—A broadly frondose nearly glabrous tree of moderate size, resembling a huge Camellia; branches spreading, smooth; branchlets leafy; leaves alternate, broadly oval or subrotund, rounded or obtusely narrowed at the apex, rounded or somewhat narrowed at the unequal obtuse 3- to 5-nerved base, closely resembling those of *Camellia japonica* L., thickly coriaceous, smooth, glabrous, entire, $1\frac{1}{2}$ to 3 in. long by $1\frac{1}{4}$ to 2 in. broad, deep green above, pale green beneath; lateral veins about 6 on each side in addition to the basal nerves, slender, clearly marked but scarcely conspicuous, anastomosing within the margin; reticulation complex; interspaces dotted above, minutely scaly-punctate beneath; petioles glabrous, smooth, moderately robust, $\frac{3}{8}$ to $1\frac{3}{4}$ in. long; stipules short, convolute, acutely conical that is pyramidately folded round the petiole, hairy outside, deciduous. In forests near Canguerasange, Bango, and Quilombo, sporadic; without receptacles, Nov. 1854. No. **6340**.

Perhaps a distinct species.

Pungo Andongo.—A high climbing shrub; branches patently recurved; branchlets irregularly twiggy, somewhat erect or patent or even recurved in the form of semicircles; leaves coriaceous, glossy, very delicately tuberculate above, paler and with raised venation beneath, 1 to $2\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{3}$ in. broad; petioles $\frac{1}{8}$ to $\frac{1}{4}$ in. long. In the forest, in the clefts of the rocks of the præsidium at Cabondo; without receptacles, Nov. 1856. No. **6363**.

This should also be compared with *F. chrysocerasus* Welw.

Pungo Andongo.—A subglabrous, much branched shrub, 5 to 7 ft. high; branchlets densely leafy; leaves alternate, obliquely oval, obtuse or rounded at the apex, unequal or sub-equal at the usually obtuse or rounded base, penniveined, coriaceous, glossy, entire, evergreen, 1 to 2 in. long by $\frac{2}{3}$ to 1 in. broad; lateral and net veins weak, not conspicuous; petioles $\frac{1}{8}$ to $\frac{1}{5}$ in. long. In elevated rocky places, in Pedras de Guinga, in company with *Myrothamnus flabellifolius* Welw. no. 1279 (*ante*, p. 331); without receptacles, March 1857. No **6362**.

Perhaps a distinct species.

Island of Madeira.—A small tree; branchlets glabrous, not scabrid, leafy; bark lenticellate, somewhat ashy and rimose; leaves alternate, entire, elliptical, somewhat oblique, shortly and obtusely narrowed at the apex, obtuse and slightly emarginate on the upper face at the feebly trinerved base, glabrous, smooth, thinly coriaceous, not conspicuously penniveined, punctulate and minutely pitted on both faces, dark green above, slightly paler beneath, $2\frac{3}{8}$ to $3\frac{1}{2}$ in. long by 1 to $1\frac{1}{2}$ in. broad; petioles dusky, glabrous, $\frac{1}{3}$ to $\frac{1}{2}$ in. long; receptacle pisiform, glabrous, smooth, $\frac{1}{3}$ in. in diameter, containing numerous male and a few female flowers; no gall-flowers seen; ostiole somewhat prominent, $\frac{1}{8}$ in. in diameter; basal bracts 2, glabrous, short, broad, rounded; male perianth shortly funnelshaped, bluntly trigonous, $\frac{1}{20}$ in. long, shortly pedicellate or subsessile, tripartite, the segments obovate, valvate; stamen solitary; female perianth $\frac{1}{24}$ in. long; style short; stigma longer, with a filiform apical appendage. At Funchal; fl. Aug. 1853. No. **6401**.

Perhaps an introduced tree.

8. **F. ottoniæfolia** Miq. Ann. Mus. Bot. Lugd.-Bat. iii. p. 288 (1867).

Urostigma ottoniæfolium Miq. in Hook. Lond. Journ. Bot. vi. p. 557 (1847), & vii. t. 13, fig. B (1848), and in Hook. Niger

Fl. p. 521 (1849), and Afrik. Vijge-Boom. p. 37 (1849). *F. Lucanda* Welw. ex Ficalho Pl. Uteis, p. 269 (1884).

A tree, 20 to 35 ft. high, but usually met with as a much-branched shrub of 5 to 6 ft. and then closely resembling in its foliage a young erect plant of ivy, glabrous, not lactescent but exuding a watery viscid sap; branches patent, very crowded; bark grey-dusky or ashy; branchlets spreading ascending or somewhat erect, rambling, pale green or somewhat dusky towards the apex; leaves alternate, entire, elliptical or somewhat oval, cuspidate with a long acumen at the apex, obtusely contracted or nearly rounded at the base, rigidly and thinly coriaceous, very bright and deep green or varnished-glossy above, paler beneath, nearly always conduplicate and pendulous, quivering, $2\frac{1}{2}$ to $5\frac{1}{2}$ in. long by 1 to $2\frac{3}{4}$ in. broad; 3-nerved at or near the base; midrib clearly raised beneath, narrowly depressed above; principal lateral veins about 3 or 4 on each side, slender, with inconspicuous intervening shorter ones; net-veins slender; petioles $\frac{1}{2}$ to $4\frac{3}{4}$ in. long, rather slender; stipules about $\frac{1}{8}$ in. long or more, broad-based, glabrous, caducous; receptacles very abundant, 1 or 2 together and often with a third one springing from the same point on the thicker branches, sometimes also on the trunk where it is a foot in diameter and on the slender green branches, at first green, afterwards turning yellow, pyriform, or on the younger branches cerasiform, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, $\frac{3}{5}$ to $\frac{1}{2}$ in. in diameter, each containing male, female, and gall flowers, beset outside with small distant hemispherical warts, faintly ribbed and veined; basal bracts short, connate below; ostiole with small bracts; peduncles $\frac{1}{4}$ to $\frac{3}{4}$ in. long, arching upwards; internal bracteoles narrow; stamen 1; stigma elongated.

Golungo Alto.—In Sobato de Bango Quilombo and about Muria, occasional; ripe fr. Jan. 1855. No. **6391**. At the outskirts of secondary woods near Banza de Bango; without fl. or fr. Jan. 1855. No. **6393**. Chiefly in the elevated forests of Quilombo Bango, more rarely by thickets near Trombeta; unripe fr. Aug. 1855. No. **6392**.

The native doctors call it "Lucanda"; it is one of species of the genus called by the collective name of "Molemba." A very small species of *Cynips* chooses this plant by preference for its abode.

9. **F. verruculosa** Warb., *l.c.*, p. 166.

Huilla.—A tree of moderate size, more than 25 ft. high; leaves pallid beneath and densely punctate but not glaucous; receptacles greenish. In the denser forests between Monino and Eme; fl. and unripe fr. April 1860. No. **6375**. A large tree, not uncommonly above 80 ft. high and 3 to 10 ft. in diameter; branches spreading; aërial roots slender, blood-red; fruit turning red, eaten by the negroes. In the Monino forests by streams; fl. and fr. May 1860. No. **6366**.

10. **F. præruptorum** Hiern, sp. n.

An elegant tree, 15 to 20 ft. high, perhaps at length taller, with the habit of a laurel; branches and leafy branchlets erect-spreading, turning reddish-brown and glabrous, nodulose; head dense; young shoots pubescent with short whitish spreading

hairs; leaves alternate, entire, oval, rounded or obtusely pointed at the apex, rounded or somewhat narrowed at the base, glabrous, rigidly coriaceous, glaucous-green above, glaucescent beneath, scarcely or slightly punctate, 1 to 2¼ in. long by ½ to 1 in. broad, inconspicuously 3- or 5-nerved at or near the base, narrowly revolute on the margin; venation in relief on both faces; midrib stronger than the lateral veins, the latter 6 to 8 on each side, erect-patent, slender, parallel and straight for the greater part of their length, branched in a reticulate manner, anastomosing within the margin, with other shorter anastomosing and intervening lateral veins; petioles puberulous with short slender whitish spreading hairs, pallid, moderately thick, ⅕ to ⅜ in. long; stipules lance-shaped, ⅓ in. long, puberulous on the back, caducous; receptacles pisiform, turning red, ⅙ to ⅕ in. in diameter, obsoletely tomentellous and puberulous with short scattered spreading hairs, mostly 2 or 3 together in the axils of present or fallen leaves, crowded, bracteate at the base; bracts short, connate, obtuse, obsoletely tomentellous and puberulous; ostiole with short thin lobes puberulous on the back; peduncles tomentellous and puberulous, $\frac{1}{16}$ to $\frac{1}{12}$ in. long; male, female, and gall flowers in the same receptacles; stamens solitary; stigmas elongated.

Huilla.—On the steep slopes of Morro de Monino; fr. end of March 1860. No. **6373**.

Nearly related to *F. verruculosa* Warb.

11. **F. Dekdekena** A. Rich. Fl. Abyss. ii. p. 268 (1851).

Urostigma Dekdekena Miq. in Hook. Lond. Journ. Bot. vi. p. 558 (1847), and Afrik. Vijge-Boom. p. 36 (1849).

Huilla.—A large tree, 80 to 100 ft. high, developing beards, trunk 6 ft. in diameter. Near Banza do Soba Nangolo, Lopollo; without fl. or fr. April 1860. No. **6372**.

In the absence of flowers or fruits, the identification must be considered doubtful.

12. **F. chrysocerasus** Welw. ex Warb., *l.c.*, p. 167.

Libongo.—A broadly frondose tree, 25 to 35 ft. high; head ovoid-hemispherical, very densely ramulose; leaves comparatively small (1 to 3 in. long by ½ to 1¼ in. broad), rigidly coriaceous, glossy, evergreen; receptacles very abundant, like cherries in shape, ⅓ to ⅔ in. in diameter, shortly pedunculate, golden yellow, broadly umbonate, much delighted in by wild birds and also by negro children. In wooded not very damp places in the district (and in Ambriz); fl. and fr. Sept. 1858. No. **6357**.

"Zandeiro," perhaps a corruption of "Nandeira," is the local name of this tree in Libongo.

The following No. has larger leaves somewhat cordate at the base and deciduous, with rather longer petioles; it should be compared with this species:—

Ambriz.—A small tree, with very deciduous leaves (2½ to 4 in. long by 1 to 1½ in. broad), quite covered with golden-yellow fruits, and surrounded by hundreds of birds. Hill near Ambriz, in company with *Eugenia* (cf. *E. quinoensis*, *ante*, p. 359; Welw. herb. no. 4396); fl. and fr. Nov. 1853. No. **6383**.

13. **F. psilopoga** Welw. ex Ficalho, *l.c.*, p. 270, and ex Warb., *l.c.*, p. 164.

Cf. *F. chlamydodora* Warb., *l.c.*, pp. 163, 164; Engl. Pfl. Ost-Afr., C, p. 161, t. 8. fig. A-F (1895).

Barra do Dande.—Aërial roots turning a blood-red colour, juicy, largely used by the natives as a styptic medicine. Trees were seen in some instances in fruit with foliage, in others in fruit without foliage, and in others again in leaf without flower or fruit, all these cases in the same place and at the same time, Nov. 1853. No. **6352** partly.

Loanda.—Cultivated in the public walks at Loanda; fr. May 1854. No. **6352** partly.

Golungo Alto.—A handsome evergreen tree, 30 to 60 ft. high; head broad, ovoid-oblong; branches patent, throwing out very crowded aërial roots which hang down vertically and when they reach the ground take root and give rise to fresh trunks, the latter at length attaching themselves in an arching manner to the mother plant; receptacles turning red, equalling small cherries in size, eaten by the negroes. In primitive forests throughout the wooded mountainous districts; among the Alto Queta mountains; fl. and fr. May 1856. No. **6352** partly. An extensive tree, with long red beards, that is, furnished with reddening aërial roots issuing from the lower side of the branches; leaves coriaceous, shining, sometimes deciduous, sometimes evergreen; receptacles 2 or 3 together, sessile, turning red, equal to large peas in size, At the outskirts of forests, about villages, etc.; fl. and fr. May 1855. No. **6351**. A tree, 25 to 35 ft. high; head ample; trunk angular below, straight, furnished with red beards; leaves thickly coriaceous, very highly shining, with red midribs; receptacles like cherries in size and shape, turning red, soft; pulp viscid; seeds numerous. In the primitive forests of Bango and Quilombo, also in Sobato de Bumba; fl. and fr. beginning of Nov. 1855. No. **6349**.

Ambaca.—A tree, 20 to 30 ft. high, exuding an abundant milk; head widely spreading; leaves coriaceous, glossy; ripe receptacles red-purple, as large as small cherries. At the outskirts of primitive forests near Mata de Cabondo; fl. and fr. June 1855. No. **6418**.

The Portuguese colonists call it "Incendeira," a name which the negroes corrupt into "Sandeira." The native name in Golungo Alto is "Mulemba" or "Molemba" or "Malemba," in plural "Milemba"; it is indigenous also in the virgin forests of Ambriz and Cazengo nearly everywhere but sporadic, and it is frequently cultivated about villages; a decoction of the Mulemba beards, that is the aërial roots, is employed by the natives in eruptive fevers and diarrhœa, and it is also used externally to wash ulcerating sores. The medicinal virtue of it appears to depend upon an astringent principle in which it abounds; the natural colour of these roots, when fresh, is blood-red with a peculiar lustre almost coppery, and their size often exceeds a yard and a half: they hang down vertically from the lower branches of the trees in the form of purple besoms. See Welwitsch, Synopse Explic. p. 28, n. 63 (1862). It affords the principal nourishment for a water-distilling Cicada, and is the favourite haunt of very beautiful Cetonias. *Combretum flammeum* Welw. herb. nn. 4297, 4351, *ante*, p. 344, grew in Molemba groves in Golungo Alto in Nov. 1854 and Oct. 1855; and lichen n. 438 grew on this fig at Sange in May 1855; also the fungus n. 50 at Canguerasange in Nov. 1854 on the trunks.

14. **F. Volkensii** Warb., *l.c.*, p. 167.

Golungo Alto.—A small tree; trunk bare of branches below: primary branches throwing out adventitious roots; head small, very densely spherical; branchlets very numerous, intricately intertwined. At the outskirts of the forests near Sange, rather rare; without receptacles, Nov. 1855. No. **6346**.

In the absence of the inflorescence this identification is doubtful; the foliage agrees fairly well with the type, which belongs to the Usambara country; but the petioles are usually rather shorter in proportion to the length of the leaf-blades; they, however, vary from $\frac{1}{4}$ to $\frac{5}{6}$ in. long.

15. **F. persicifolia** Welw. ex Warb., *l.c.*, p. 162; Engl. Pfl. Ost-Afr., C, p. 162, t. 8. fig. G-J (1895).

Golungo Alto.—A remarkably singular tree, with very bright flowers, in its early youth parasitical after the fashion of *Viscum album* L., growing on Adansonias; afterwards in the adult state throwing out its own roots close to the trunk of its host and becoming a tree, embracing with the lower flattened-reticulate part of its trunk that of its host and quasi-confluent with its surface but above emancipated from it and forming a cylindrical trunk; head dense, with its branches and glossy leaves emulating the crown of its host; bark from whitish to grey, like that of the Adansonia; leaves lanceolate-spathulate, attenuate at the apex into an obtuse oblique acumen, coriaceous; receptacles as large as small peas, two together in the axils of the leaves, exactly spherical, very crowded, turning red when ripe, beset with elevated circular glands, borne on somewhat curved peduncles of $\frac{1}{12}$ in. long, seated at the base on a cup-shaped 4- or rarely 5-cleft involucre with obtuse lobes. In the damp denser forests near Bango at the base of the Quilombo mountains; also on the left bank of the Cuango rivulet near Canguerasange, by Adansonias, not uncommon; fr. Nov. 1854. No. **6337**. An elegant tree, 15 to 25 ft. high; head spreading widely; branches patent or even drooping; leaves like those of *Amygdalus Persica* L., lanceolate-oblong, glossy, drooping or pendulous; ripe receptacles as large as small peas, beset with distant whitish warts, solitary or two together in the axils of the leaves, sessile or on peduncles of $\frac{1}{16}$ in. At the margins of the less dense forests near N-delle and Quibongo and on the elevated parts of Quilombo Quiacatubia, plentiful; fr. Aug. 1855. Native name "Quisacalémba" or "Quisasalembia." No. **6336**. At Sange; fr. end of Sept. 1855. No. **6417**. A very elegant tree, 20 to 30 ft. high, with the habit of an almond; trunk somewhat marked with very obtuse angles; branches patent; leaves crowded chiefly at the ends of the branchlets, coriaceous, in damp places evergreen: receptacles green. In the primitive forests of the Alto Queta mountains, above N-della, in company with *Symphonia globulifera* L.f. (*ante*, p. 59, Welw. herb. no. 1052); nearly ripe fr. May 1856. No. **6412**.

The lichen n. 284 grew on the leaves of this tree near Bango and Canguerasange in Nov. 1854.

16. **F. barbata** Warb., *l.c.*, p. 168; non Wall. List, n. 4576 (1831).

F. andongensis Welw. ex Welw & Curr. in Trans. Linn. Soc. xxvi. p. 284 (1868), without description, and ex Warb., *l.c.* *F. humilis* Welw. ex Warb., *l.c.*

Pungo Andongo.—A strongly branched tree, 8 to 12 ft. high; branches quite patent or curved-ascending; branchlets somewhat

erect, leafy at the apex, almost all of them fruiting ; leaves coriaceous ; stipules reddish ; receptacles spherical, green even when ripe, beset with warts of various sizes, based with very broad bracts, impressedly umbonate at the apex. In fissures of the more elevated rocks of the præsidium and at their summits, Pedra de Cazella ; fl. and fr. 18 Dec. 1856. No. **6361**.

The fungus n. 17, *Pestalozzia depazeoides* Welw. & Curr., *l.c.*, p. 284, t. 17, fig. 14, grew on the leaves of this tree.

Mossamedes.—A small tree, decumbent after the manner of *Pinus montana* Mill., copiously lactescent ; leaves evergreen, cordate-elliptical, obtuse, coriaceous, glossy above. On the declivities of rocks by the river Bero, about 4 leagues distant from the ocean ; without fl. or fr. July 1859. No. **6380**.

F.? barbata Wall. is supposed to be identical with *F. villosa* Bl. (1825).

17. **F. Carica** L. Sp. Pl., edit. 1, p. 1059 (1753) ; Miq. Annal. Mus. Bot. Lugd.-Bat. iii., p. 289 (1867) ; Ficalho, *l.c.*, p. 271.

Golungo Alto.—Cultivated by plant fanciers in various but few places ; it affords well tasted fruit but always inferior to that grown in Europe. At Sange in Senhor Rodrigo's garden, where Welwitsch saw it in fruit ; only in leaf, 14 Dec. 1854. No. **6388**.

It has also been introduced into the district of Pungo Andongo, where it loses its leaves in the winter, that is, from June to September ; but the leaves are not then deciduous in Golungo Alto ; in this respect its behaviour is similar to *Vitis vinifera* L.

18. **F. pendula** Welw. ex Van Tieghem in Bull. Soc. Bot. France, xli. p. 486 (Sept. 1894), name (*pendulus*) only ; non Link (1822).

Shrubby ; branches very long, sarmentose, climbing high and far, pendulous ; the younger and fruiting branchlets nodding, all ashy, turning purplish in the dried state, more or less hispid-pubescent ; internodes mostly $\frac{1}{2}$ to $3\frac{1}{2}$ in. long, the uppermost ones shorter ; leaves alternate, very rough above, tomentose beneath, very unequal at the base, more or less denticulate on the margin, rigidly herbaceous, 3 to 6 in. long by 1 to 4 in. broad, obliquely ovate or lanceolate-oblong, acuminate at the apex, very obtuse or semi-truncate at the trinerved base, heteromorphous, undivided or irregularly 3- to 7-cleft with rounded sinuses ; lateral veins about 5 to 7 on each side in addition to the basal nerves, rather slender, hairy ; tertiary veins patent ; reticulation delicate ; interspaces roughly punctate above ; petioles $\frac{1}{8}$ to $\frac{1}{2}$ in. long, hispid-pubescent or scabrid ; stipules $\frac{1}{6}$ to $\frac{1}{5}$ in. long, hispidulous on the back, smooth within, from a broad base ovate, caducous ; receptacles axillary, solitary, globose-pyriform, as large as a very big cherry, $\frac{3}{4}$ in. long or more, greenish red when ripe, beset outside with small piliferous glands. Male and female flowers in the same receptacle ; perianth 5-cleft ; male flowers next the ostiole ; stamens 1 or 2, mostly solitary ; style short. Bracts at the base of the receptacle small ; ostiole circular, surrounded with scarious densely pilose rigid scales ; peduncle $\frac{1}{3}$ in. long, arched, with small piliferous glands.

Pungo Andongo.—In primitive forests on the Calemba islands in the river Cuanza, plentiful; fl. and fr. 12 March, 1857; also about Lombe and Condo, March 1857, the matrix of *Loranthus combretoides* Engl. (Welw. herb. no. 4852; *ante*, p. 927). No. **6359**.

F. pendula Link, Enum. ii. p. 450 (1822), has been reduced to *F. benjamina* L.

19. **F. brevicula** Hiern, sp. nov.

An erect shrub, 4 ft. high; stems densely hispid with short whitish spreading hairs, simple in the upper half, leafy above; leaves alternate, obliquely ovate obovate or oblong, irregularly toothed except the basal part or shortly lobed in a more or less ficiform manner, obtuse or somewhat pointed at the apex, obtusely narrowed or rounded at the unequal sub-triplinerved base, thinly and rigidly coriaceous, very roughly scabrous and greyish green above, softly hairy, less or but little rough and yellowish green beneath, 2 to 4 in. long by $\frac{3}{4}$ to 2 in. broad, shortly petiolate; lateral veins about 4 or 5 on each side in addition to the sub-basal nerves, slender, shortly hairy beneath; net-veins pellucid; petioles densely hispid, $\frac{1}{8}$ to $\frac{1}{6}$ in. long, broad-based; stipules ovate, obtuse, broad-based, somewhat hairy on the back, about $\frac{1}{3}$ in. long; receptacles axillary, solitary, pyriform-globose, pilose, about $\frac{1}{2}$ in. long (those which were examined contained female flowers only); basal bracts small, caducous; peduncle about $\frac{1}{4}$ in. long, pilose; perianth of the female flowers 5- or 6-partite; style long.

Huilla.—In thickets at the outskirts of forests, near Catumba; fl. and young fr. end of March 1860. No. **6371**.

20. **F. pygmæa** Welw. ms. in herb., sp. n.

A dwarf shrublet, 1 to 2 ft. high, rarely taller; rhizome creeping; stems ascending or suberect, pilose or somewhat hispid, branched below, leafy; leaves alternate, obliquely ovate or somewhat oblong, irregularly toothed except the basal part or shortly lobed about the middle, obtusely pointed at the apex, nearly rounded at the unequal and sub-triplinerved base, coriaceous, rigid, rough on both faces, pale yellowish green and somewhat glossy above, hispid and bright yellowish green beneath, 1 to 2 in. long by $\frac{3}{5}$ to 1 in. broad, shortly petiolate; lateral veins about 5 or 6 on each side in addition to the sub-basal nerves, rather slender, in relief and hispid beneath; petioles densely hispidulous, $\frac{1}{12}$ to $\frac{1}{8}$ in. long, broad-based; stipules ovate, obtuse, broad-based, hairy on the back, about $\frac{1}{10}$ in. long; receptacles axillary, solitary, shortly pedunculate, ellipsoidal or somewhat obovoid, scabrid, when quite ripe as large as a small pigeon's egg or small cherry, about $\frac{7}{8}$ in. long by $\frac{5}{8}$ in. broad, each containing male and female flowers; basal bracts small, deciduous; ostiole broad, about $\frac{1}{6}$ in. in diameter, surrounded with short bracteoles; male perianth mostly 5-cleft; stamen usually solitary; female perianth mostly 3-cleft; style rather long, minutely bifid at the apex.

Huilla.—In bushy pastures near Lopollo and throughout nearly the whole plateau of Huilla, plentiful; fl. and nearly ripe fr. Feb. and April 1860. No. **6370**.

21. **F. urceolaris** Welw. ms. in herb., sp. n.

A copiously lactescent shrub, 4 to 6 ft. high or rather more, branched from the base, or a small tree, with the aspect of *Trymatococcus*; branches virgate, patent, subterete or roundly angular, not pubescent, usually more or less scabrid, drab; internodes mostly $\frac{1}{2}$ to 2 in. long; leaves alternate, elliptical or somewhat oblong, narrowly cuspidate-acuminate at the apex, very unequally contracted at the trinerved base, chartaceous-coriaceous, glabrous, subglaucous green and nearly smooth or slightly rough above, pale green and very rough beneath, somewhat toothed or repand on the narrowly revolute margin, 4 to $10\frac{1}{2}$ in. long by $1\frac{1}{2}$ to 4 in. broad (or in the variety smaller); the old ones and even the adult ones often nearly all pendulous; lateral veins about 6 to 8 on each side in addition to the basal nerves, patent-arching, anastomosing, rather slender, scabrid and in clear relief beneath, narrowly impressed above; tertiary veins patent; net-veins slender; interspaces minutely papillose-punctate and scabrid beneath; petioles $\frac{1}{4}$ to $\frac{3}{4}$ in. long, scabrid, often bent or flexuous, broad-based, channelled above; stipules from a broad base ovate, acute, scabrous on the back, $\frac{1}{3}$ to $\frac{1}{2}$ in. long, deciduous; receptacles axillary, 2 or 3 together or solitary, shortly pedunculate, urceolate-pisiform, widely gaping at the apex, scabrid, $\frac{1}{5}$ to $\frac{1}{3}$ in. in diameter; basal bracts small or obsolete; osteole comparatively large, $\frac{1}{12}$ to $\frac{1}{10}$ in. in diameter, prominent. In the receptacles which were examined only female flowers and neuter flowers or fruits were found; perianth 4- or 5-partite; ovary smooth; style short or of moderate length, elongating in fruit, slender, lateral; achenes about $\frac{1}{20}$ in. long, pale, shining; stigma black or dusky.

Golungo Alto.—In mountainous places at the banks of the rivulet Quiapoze near Golungo Alto, sparingly; female fl. 23 Sept. 1854. No. **6390**. In primitive forests by streams and in rather dry shady places; in the virgin forest of Quisuculo, fr. 8 Sept. 1855. No. **6336**. In primitive forests in Sobato de Bumba near Quibixe at the river Cate; female fl. Sept. 1855. No. **6394**. By streams in the shady parts of Mata de Quisuculo; with ripe receptacles. 28 April, 1856. No. **6402**.

Var. **bumbana**.

Leaves 1 to $4\frac{1}{4}$ in. long by $\frac{3}{4}$ to $1\frac{3}{4}$ in. long.

Golungo Alto.—A shrub, 5 ft. high, very patently branched; ripe receptacles orange-red, pisiform. In the dense forests of Sobato de Bumba; fr. July 1856. No. **6403**.

On No. 6336 probably grew the lichens, n. 288, *Lecidea exiguella* Wain., and also *Strigula atrocarpa*, *S. hypothelia*, *S. africana*, and *Asterothyrum Welwitschii*.

22. **F. exasperata** Vahl, Enum. Pl. ii. pp. 197, 402, 409 (1806); Miq. in Hook. Lond. Journ. Bot. vii. p. 231, t. 14, fig. C (1848), and Afrik. Vijge-Boom. p. 21 (1849); non Roxb. *F. scabra* Willd. in Mém. Berol. 1798, p. 102, t. 2 (1801); non Forst. f. (1786), nec Jacq. (1798).

A tree, 20 to 40 ft. high, patently branched, loosely frondose;

sap watery, viscid; bark grey; branchlets scabrid; leaves alternate, ovate or somewhat oval, shortly acuminate at the apex, rounded or emarginate at the base, firmly membranous, very scabrous on both faces, not pubescent, denticulate or repand along the general outline except near the base, somewhat glossy above with a peculiar lustre, paler beneath, deeply or acutely palmate-lobed in the case of young plants up to the third to fifth year of age, 2 to 6 in. long by 1 to 4 in. broad, trinerved at the base; principal veins about 3 or 4 on each side in addition to the basal nerves, strongly marked beneath, feeble above, their branches more or less transverse and passing by degrees into a delicate but not conspicuous reticulation; petioles $\frac{1}{4}$ to $1\frac{3}{4}$ in. long, scabrous; stipules scabrid on the back, broadest at the base, lanceolate, smooth inside, acute, pallid, $\frac{1}{6}$ to $\frac{1}{4}$ in. long, deciduous; receptacles spherical, a little smaller than a hazel nut, about $\frac{1}{2}$ in. in diameter or less, scabrid, in pairs, pedunculate, on the branchlets or young lateral shoots, from yellow to red when ripe, 4-bracteate with two of the bracts attached to the base and the other two opposite to them and attached near the middle of the receptacle; osteole closed with 3 to 5 small ovate obtuse bracts; peduncles from $\frac{1}{8}$ to less than $\frac{1}{2}$ in. long, scabrid, often bracteate with short obtuse bracts. All the receptacles examined had female flowers only, with long slender styles and stigmas.

Golungo Alto.—In the more elevated forests and at the sides of hills about Bango, Canguerasange, Cambondo, and Trombeta, plentiful; fl. 3, 7, and 25 Nov. 1854. No. **6387**. A tree, at the Governor's house at Sange, supposed to be ornamental; fl. beginning of Oct. 1855. No. **6411**.

The extremely rough leaves are used for polishing purposes and called "Lixa"; the tree is called "Lima" (a file). The fungus n. 76, *Phyllachora repens* Sacc., grew on the leaves.

The branches, even when a foot thick, readily take root, when driven into the ground; the trees afford excellent shade, and on this account they are frequently used for avenues, etc., in public places. The wood is good and white; the natives of Golungo Alto call it "Mucacasa."

This is probably the species of *Ficus* referred to in Bowdich's Mission to Ashantee (1819), p. 445, and locally named "Egoëgoo"; the leaves were used in planing wood, polishing and cleaning various articles of household furniture, and feel like emery paper.

It is difficult to separate this species from *F. asperifolia* Miq., *l.c.*, t. 15, fig. B, especially as in No. 6387 the leaves are polymorphous; the perianth lobes are ciliolate, and in this respect agree with the figure quoted above for *F. exasperata*. With the original description Vahl's trivial name is misprinted *axasperata*, but this is corrected, *l.c.*, p. 402, and in the index at the end of the volume it appears as corrected.

23. **F. brachylepis** Welw. ms. in herb., sp. n.

A tall or moderate-sized tree, glabrous throughout, very copiously milky, with widely spreading head; branches patent; branchlets spreading, smooth, green, dusky in the dried state, often quasi-verticillate by the approximation of the nodes and in this way fasciculate, leafy towards the apex; leaves alternate and

often fasciculate or quasi-verticillate, entire, ovate-oblong oval or broadly lanceolate, shortly and obtusely acuminate or acute or rounded at the apex, feebly 5- or 7-nerved at or near the emarginate or rounded or subtruncate base, smooth, coriaceous, more coriaceous and thick than in *F. psilopoga* Welw. herb. no. 6351 and much less so than in *F. elastica* Roxb., deep green and varnished-glossy above, paler and also somewhat shining beneath, $3\frac{1}{2}$ to 7 in. long by $1\frac{1}{4}$ to 3 in. broad; midrib thick, strongly prominent, always deep rosy or red beneath; principal lateral veins about 8 to 10 on each side in addition to the basal nerves, slender, anastomosing within the margin; reticulation small, delicate, with minute dots in the interspaces; petioles green, 1 to 3 in. long, minutely dotted, broad-based; bud-scales or stipules small, scarcely $\frac{1}{6}$ in. long, pale purplish, from a very broad base subulately acuminate, but little viscid, caducous; receptacles on the 2 to 5 year old branches and also on the trunk, 2 or 3 or even 6 to 8 together, but mostly quaternately umbellate, pyriform, as large as a walnut, 1 to $1\frac{1}{2}$ in. long, $\frac{3}{4}$ to $1\frac{1}{4}$ in. thick, from green to yellowish, smooth, densely beset with small whitish scarcely elevated spots; only female and gall flowers seen in the receptacles examined; style long, slender; peduncles flattened, dilated, 1 in. long; bracts at the base of the receptacle deciduous; those of the ostiole small, deciduous.

Golungo Alto.—In the primitive forests of Quisuculo in Sobato Bango, and in Sobato Quilombo; fr. Sept. and Nov. 1854; also at Sange, fr. end of Sept. 1855. No. **6338** and Coll. Carp. 900. Without receptacles. No. **6419***b*.

24. **F. Sycomorus** L. Sp. Pl. edit. 1, p. 1059 (1753); Oliv. & Grant in Trans. Linn. Soc. xxix. p. 149. t. 99 (1875); Ficalho, Pl. Uteis, p. 271 (1884).

Sycomorus antiquorum Gasparr. Ricerch. Caprif. e Fic. p. 86 (1845); Miq. Afrik. Vijge-Boom. p. 9 (1849).

Var. **prodigiosa** (Welw. ms. in herb.).

A very ornamental tree, 20 to 35 ft. high, glabrous except the buds; trunk straight or oblique, 1 to $2\frac{1}{2}$ ft. in diameter, branched a little above the base; branches patent, crowded, intricate; head evergreen, broadly spreading, rather lax; leaves broadly oval or somewhat ovate-oval, obtuse or rounded at the apex, nearly rounded or cordate and trinerved at the base, coriaceous, smooth, pale or deep green above, pale green and glaucescent or somewhat coloured beneath, rather glossy on both faces, 2 to 5 in. long by $1\frac{1}{2}$ to $3\frac{1}{4}$ in. broad, entire or subrepand; lateral veins 2 or 3 on each side in addition to the basal nerves, inconspicuous above, whitish and in clear relief beneath, anastomosing near the margin, delicately and transversely venulose; net-veins inconspicuous; petioles thick, cylindrical, somewhat fleshy, transversely wrinkled, $\frac{1}{2}$ to 2 in. long, turning reddish; stipules ovate-triangular, about $\frac{1}{4}$ in. long, pubescent on the back, caducous; receptacles pyriform, racemose-paniculate on their own leafless

branchlets hanging down from a little above the base of the trunk up to the division of the top principal branches, obovoid-globose, $1\frac{2}{3}$ in. long by $1\frac{1}{3}$ in. thick, with 2 or 3 smooth more or less patent bracts a little below their base, flattened at the apex, with the ostiole closed with small bracts, yellow-red when ripe, juicy, eaten by the negroes and colonial travellers; taste not unpleasant but a little watery; the skin resinous and very bitter; about $\frac{1}{4}$ in. long; some panicles bearing 60 to 80 or more receptacles, and the trunk not rarely decked up to the height of a man with 5 to 8 or 12 pendulous panicles, all laden with bright rosy receptacles and thus presenting an aspect of the highest fruitfulness.

Huilla.—In the Monino forests; without fl. or fr. Feb. 1860. No. **6368**. In forests about Lopollo, plentiful; ripe fr. 16 May 1860. No. **6369**.

Nearly all the ovaries were pierced by a very long-tailed Hymenoptera, perhaps a species of *Cynips*.

Var. **alnea**.

A densely frondose tree, resembling an alder in habit, 20 to 30 ft. high, or in secondary woods 15 ft., branched a little above the base; head ovoid; branches long, patent, rambling; branchlets glabrescent, purplish in the dried state, smooth, puberulous towards the apex; leaves alternate, entire or repand, ovate or oval, obtusely pointed or rounded at the apex, more or less cordate at the 3- or 5-nerved base, glabrous or nearly so, deep green, glossy above, more or less glaucous, sometimes turning reddish beneath, persistent, those on the younger plants large, 9 to 10 in. long by 5 to 6 in. broad and but little coriaceous, those on the adult or fruiting trees smaller 2 to 7 in. long by $1\frac{1}{2}$ to 4 in. broad and more compact; lateral veins 3 or 4 on each side in addition to the basal nerves, slender, feebly anastomosing; tertiary veins patent, weak; reticulation delicate, inconspicuous; interspaces minutely dotted or on the smaller leaves marked with less minute raised points; petioles purplish, glabrous, $\frac{3}{4}$ to $3\frac{1}{2}$ in. long; stipules ovate, acute, more or less pubescent or silky on the back, glabrous within, $\frac{3}{8}$ to $\frac{1}{2}$ in. long, caducous; receptacle pyriform-globose, $\frac{5}{6}$ to 1 in. long, not quite as thick, lateral, solitary, containing male, female, and gall flowers; male flowers with bipartite perianth and 2 stamens; female flowers with rather long style proceeding from a side of the top of the ovary; basal bracts 3, puberulous; ostiole $\frac{1}{12}$ in. in diameter, not very prominent; peduncle prominent, $\frac{1}{4}$ in. long.

Mossamedes.—In thickets grown up after destruction of the forests, near the mouth of the river Giraul and Libata de Giraul, occasional, without fl. or fr. (19 July?), 1859. No. **6377**.

Bumbo.—In forests at the base of Serra da Xella, in company with *Ranunculus pinnatus* Poir. (Welw. herb. no. 1209; *ante*, p. 4), and "Páo d'Oleo," that is, *Adina microcephala* Hiern (Welw. herb. no. 3029; *ante*, p. 434), sporadic; fr. 20 Oct. 1859. No. **6376**.

Huilla.—From Monino towards Eme and at the river Mupanda, sporadic; fl. and fr. April 1860. No. **6367**.

Perhaps a distinct species.

Var. **polybotrya.**

A tree, 20 ft. high, lactescent; the trunk and older branches laden with very copious fruiting branchlets; leafy branchlets dusky and glabrescent except the hairy pallid tips, frondose towards the apex; leaves caducous at the time of the young flower-receptacles, but developed afresh as the fruit-receptacles ripen, alternate, ovate or oval, obtuse or shortly and obtusely acuminate at the apex, somewhat unequal and emarginate or obtuse at the trinerved base, firmly coriaceous, obtusely toothed or repand on the margin, dark green and glabrous above, brown and tomentellous beneath, $2\frac{1}{4}$ to $4\frac{1}{2}$ in. by $1\frac{1}{4}$ to 3 in. broad; lateral veins erect-patent, 3 to 5 on each side in addition to the basal nerves, all as well as the midrib in relief and hairy beneath; tertiary veins patent; net-veins minute, impressed; petioles $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, broad-based, puberulous; stipules from a broad base ovate, hairy on the back, $\frac{1}{8}$ to $\frac{1}{4}$ in. long, caducous; flowering branchlets 5 to 6 in. long or more, paniculately divided; receptacles subsessile or on short pedicels, tomentellous with pallid short hairs, on our specimens small and young.

Golungo Alto.—In damp places near Menha Lula in Sobato Mussengue; young fl. May 1855. No. **6343.**

The foliage somewhat resembles that of *Ficus clethrophylla*.

25. **F. trachyphylla** Fenzl in Flora 1844, p. 311; Warb., *l.c.*, p. 153.

Sycomorus trachyphylla Miq. in Hook. Lond. Journ. Bot. vii. p. 110 (1848), and Afrik. Vijge-Boom p. 11. t. 1, fig. C (1849).

Zenza do Golungo.—A small tree, 12 to 15 ft. high, probably a young one; bark from whitish to reddish; branchlets brick-red. In palm groves by the river Bengo from the Convent of St. Anthony to Funda, sporadic; without fl. or fr. end of Dec. 1853. Determination doubtful. No. **6353.**

Golungo Alto.—A tree 20 ft. high; branches patent, curved or even flexuous. In wooded thickets on the left-hand side of the road leading to Ambaca, near the virgin forest of Quibango; unripe fr. April 1856. Native name "Mucuso." Determination doubtful. No. **6415.**

Mossamedes.—A tree, 20 to 25 ft. high; head ovoid, elongated, densely frondose; leaves persistent, rough; receptacles pyriform, as large as a walnut, tomentose, scarcely well tasted. In secondary thickets and in places formerly wooded at the mouth of the river Giraul, occasional; fl. and fr. July 1859. Determination doubtful. No. **6378.** A tree, 15 to 25 ft. high; head ovoid-dilated. Here and there at the banks of the river Bero, at Cavalheiros, without receptacles, July 1859. Perhaps a variety of this species. No. **6382.**

Huilla.—A tree 20 to 30 ft. high; head broadly ovoid; branches and branchlets patent, more or less tortuous; receptacles on the fresh branchlets, rarely on the older branches, pear-shaped, $\frac{3}{4}$ in. long, hoary, silky-tomentose, axillary, solitary, bracteate at the base; peduncle $\frac{1}{4}$ in. long, robust, somewhat rufous, puberulous. In forests about Lopollo, 5000 to 5504 ft. alt., sporadic; fl. and unripe fr. Feb. 1860. No. **6374.**

In Golungo Alto *Loranthus Belvisii* DC. (Welw. herb. nn. 5279, 5280; *ante*, p. 934), grew as a parasite on a species of fig, perhaps

this tree ; at Sange in March 1856, the lichens nn. 163 (*Buellia disciformis* var. *minor* f. *rugulosa*), 430 grew on the branchlets ; in Huilla at Monino in May 1860 the fungus n. 141, *Phyllachora repens* Sacc., grew on the leaves (cf. A. L. Sm. in Journ. Bot. xxxvi. p. 176, May 1898).

I have not seen the type of this species.

26. **F. Mucuso** Welw. ex Ficalho, *l.c.*, p. 270.

Golungo Alto.—A small tree of 10 to 12 ft. or a large tree of 39 to 40 ft. high and more ; trunk obliquely ascending ; head widely spreading ; branches glabrate, not scabrid, curved-ascending or on the large trees patent and usually nodding-ascending ; bark ruddy ; branchlets rather thick, leafy towards the apex, longitudinally wrinkled and transversely scarred and at first bearded after the fall of the stipules ; leaves alternate, entire or subrepand, broadly oval or subrotund, often shortly apiculate at the apex, deeply cordate or sub-reniform at the base, rigidly coriaceous, dark green very scabrous and with scattered pallid hairs above, somewhat tawny green rather softly pilose and not scabrid beneath, 1⅛ to 5 in. long by 1 to 3½ in. broad, 3- to 9-nerved at the insertion of the petiole, the three central nerves stronger than the rest ; lateral veins 3 or 4 on each side in addition to the basal nerves ; petioles ½ to 1¾ in. long, robust, rigid, bearded with long hairs which arise from thickened chaffy bases ; stipules broad at the base, ovate, pointed, bearded on the back, glabrous inside, ⅛ to ½ in. long, deciduous ; receptacles pyriform or somewhat club-shaped, comparatively large, when not quite ripe about an inch thick or rather more, softly pulpy when ripe, peach-reddish outside, tomentose or obsoletely so ; one with female flowers examined showed the perianth 5-cleft with unequal lobes terminating in filiform tips.

Golungo Alto.—On wooded slopes at the banks of the river Cuango ; fr. not then quite ripe, May 1856. No. **6416**.

Very nearly related to *F. trachyphylla* Fenzl ; it occurs also in the Kamerun country, Zenker no. 1623.

The native name is "Mucuso."

The following No., which bears the same native name, perhaps belongs to the same species.

Golungo Alto.—A robust tree, 60 to 80 ft. and more ; head dilated ; leaves subrotund, cordate-reniform at the base, 3½ to 6 in. long by 3¼ to 5½ in. broad, rigidly but not thickly coriaceous, scabrid above, very shortly and closely hairy beneath ; petioles 1¼ to 2 in. long ; receptacles pyriform-globose, juicy, of a beautiful reddish colour and somewhat roughly tomentellous outside, lateral, nodding, 1⅓ in. long by 1¼ in. thick, on a peduncle ⅔ in. long. At the outskirts of forests throughout the district, plentiful ; fr. Jan. 1855. No. **6389**.

27. **F. senegalensis** Miq. in Ann. Mus. Bot. Lugd.-Bot. iii. pp. 230, 295 (1867).

Ficus sp., Brunner in Flora 1840, beibl. i. p. 72. n. 112.

Ambriz.—Several majestic trees, 30 to 40 ft. high, in the middle of the large village of Mosul ; without fl. or fr. Nov. 1853. No. **6384**.

This identification is doubtful as both the type of the species (a specimen of which is in the National Herbarium) and our specimens are without receptacles ; our leaves measure 5¼ to 7 in. long by 2⅔ to nearly 4 in. broad, and are more deeply cordate at the base ; the

petioles measure $1\frac{1}{5}$ to 2 in. long. Miquel, *l.c.*, places his species in the section Sycomorus.

The following two Nos. are possibly allied to *F. senegalensis*, but their foliage is larger :—

A tree, 12 to 25 ft. high or perhaps taller, sometimes parasitical, exuding a very viscid milk; trunk straight, erect, bare below, hirsute when young; head hairy; branches elongated, ascending, hirsute, leafy; leaves alternate, obovate or broadly oval, often resembling in shape those of *Nymphæa lutea* L., very shortly and obtusely apiculate at the apex, more or less cordate at the 5- or 7-nerved base, membranous or somewhat thick dry and rigid, hirsute on both faces especially on the midrib and veins with rather short rigid white hairs, deep green bright and somewhat glaucescent above, paler beneath, large or even gigantic, $5\frac{1}{2}$ to 14 in. long by $4\frac{1}{2}$ to $8\frac{1}{2}$ in. broad or perhaps larger, nearly entire or repand or near the base sinuous-dentate; midrib broad, tapering; lateral veins slenderer, 7 to 9 on each side in addition to the basal nerves; tertiary veins patent, slender; reticulation minute, delicate; interspaces pallid, microscopically scaly-pulverulent; petioles hirsute, stout, 1 to 5 in. long; stipules ovate-lanceolate, strongly acuminate, nearly glabrous, bloodred-purple, $\frac{1}{2}$ to $1\frac{1}{4}$ in. long, deciduous; receptacles not seen.

Golungo Alto.—In the dense primitive forests of the Queta mountains in deep valleys close to rivulets, rather rare, parasitical on *Pseudospondias microcarpa* Engl. (cf. *ante*, p. 176); without fl. or fr. Jan. 1856. No. **6409**. In the damp forests of deep valleys among the Alto Queta mountains and in Sobato de Quilombo, sporadic; at the great cataract of the river Cuango, on the left bank; without fl. or fr. beginning of August 1855. No. **6347**.

28. **F. capensis** Thunb. Dissert. Fic. p. 13. n. 23 (1786).

Sycomorus capensis Miq. in Hook. Lond. Journ. Bot. vii. p. 113. t. 3. fig. B (1848), and Afrik. Vijge-Boom. p. 14 (1849).

Var. **guineensis** Miq. Annal. Bot. Ludg.-Bat. iii. p. 295 (1867).

F. Lichtensteinii Link, Enum. Hort. Berol. ii. p. 451 (1822). *F. Brassii* R. Br. ex Sabine in Trans. Hort. Soc. v. p. 448 (1844); non Kunth & Bouché (1846). *Sycomorus Guineensis* Miq. in Hook. Lond. Journ. Bot. vii. p. 112. t. 14. fig. B (1848), and in Hook. Niger Fl. p. 523 (1849).

A tree, 15 to 25 ft. high; trunk bare of branches below, 6 to 12 in. in diameter, divaricately branched above; branches patent; branchlets nodding-ascending, glabrate, leafy; terminal buds adpressedly hairy with pallid hairs; leaves alternate, coarsely dentate or repand, ovate or somewhat oval, mostly acuminate at the apex, unequal trinerved and rounded or cordate at the base, papery-coriaceous, deep green subglaucescent and nearly glabrous above, browner and sometimes shortly pubescent along the midrib and veins and minutely punctate with elevated points beneath, 2 to $9\frac{1}{2}$ in. long by 1 to $4\frac{1}{4}$ in. broad; lateral veins about 4 to 6 on each side in addition to the basal nerves, rather slender, in relief beneath, feebly anastomosing; tertiary

veins patent, very slender; petioles ½ to 2 in. long, glabrous or shortly pubescent; stipules from a broad base ovate, acuminate, adpressedly hairy on the back, ⅔ in. long, deciduous; receptacles pyriform or somewhat globose or contracted into a neck at the base, a little larger than the fruit of the common Service tree, ⅔ to 1 in. long, glossy, red but marked all over with bright green spots, glabrescent or somewhat pulverulent, each containing male female and gall flowers, bracteate at the base, on their own branchlets; basal bracts small, connate below, forming a trifid base to the receptacle; ostiole rather prominent, with small obtuse bracts on the margin and at length exposing the almost protruding chaffy bracteoles from the upper part of the receptacle; fruiting branchlets pendulous, proceeding from the trunk below the leafy branches, racemose-paniculate; male flowers comparatively few, each with 2 stamens; female flowers with the style somewhat lateral near the apex of the ovary.

Golungo Alto.—Close to the banks of the Delâmboa rivulet; fl. and fr. middle of April 1856, in company with *Raphia textilis* Welw. (herb. no. 6671) and *Elæis guineensis* Jacq. (Welw. herb. no. 6664). No. **6410**. No notes. In fl. and fr. No. **6422**.

This variety ought, perhaps, to be kept as a distinct species: it is probably the species of *Ficus*, mentioned by Tedlie in Bowdich, Mission to Ashantee, p. 371 (1819), as one of the medicinal plants of that country, it being there called "Adumba."

The following No. possibly belongs here:—

Island of St. Thomas.—A tree; trunk straight but little branched; head widely spreading but sparingly dense; nerves of the leaves and stipules almost like those in the genus *Macaranga* (Euphorbiaceæ). At the outskirts of the more elevated forests near Monte Caffé; without fl. Dec. 1860. Negro name "Bebé." No. **467**.

29. **F. clethrophylla** Hiern, sp. n.

A tree, from 10 to 30 ft. high or more; sap rather watery-viscid than milky; trunk whitish, strictly erect; branches smooth, spreading, glabrous; branchlets numerous, glabrescent except the extremities, spreading; habit like an alder; leaves alternate, evergreen, ovate oval or ovate-oblong, obtuse nearly rounded or sub-acuminate at the apex, nearly rounded emarginate or cordate at the base, repand-dentate or irregularly toothed except near the base, sub-chartaceous, deep green and with short hairs scattered or chiefly along the midrib and lateral veins or glabrate above, paler and usually with denser hairs beneath, resembling those of an alder, 2½ to 10 in. long by 1½ to 5 in. broad, trinerved at the base; principal lateral veins 5 to 7 on each side of the midrib in addition to the basal nerves, with some shorter intervening ones, anastomosing, all rather slender in relief beneath and narrowly impressed above; reticulation minute, delicate, with small scales or minute dots in the interspaces; petioles ranging up to 3¾ in. long, shortly pubescent or puberulous; stipules from a broad base ovate, acuminate, hairy on the back, glabrous within, deciduous, ⅜ to ⅝ in. long; receptacles sometimes racemose-

paniculate on their own branchlets with the panicles pendulous from the lower part of the trunk very numerous closely and intricately intermixed, sometimes on the same tree solitary in the axils of the leaves on the ultimate branchlets, containing male female and gall flowers in the same receptacles, spherical or somewhat pyriform, as large as a moderate-sized cherry or $\frac{3}{4}$ to 1 in. long, shortly pedunculate, usually 2 together, rarely several springing from the same point, pendulous, when ripe turning red, soft, delicately punctulate, pubescent or subglabrate, viscid, juicy, insipid, very grateful to wild birds; pulp somewhat sweet; fruiting branchlets much branched, a foot long and more, at first erect-spreading, afterwards as the fruit ripens pendulous and usually completely clothing the trunk about 9 ft. from the ground; peduncles $\frac{1}{12}$ to $\frac{1}{4}$ in. long, pubescent; bracts at the base of the receptacles small, pubescent; ostiole somewhat prominent, with short ovate apiculate glabrous bracteoles; male flowers confined to the neighbourhood of the ostiole; perianth-lobes oblong; stamens (in one flower) 4, or solitary; anthers oblong; female flowers with trifid perianths, the lobes acute; style rather long, arising from one side near the top of the ovary; gall flowers on flattened-winged lanceolate pedicels.

Golungo Alto.—By streams in Sobato de Bumba, Bango, etc.; fl. and fr. Dec. 1854; at the Quiapoze stream in Sobata Bumba; fl. and fr. May 1855. No. **6335**. In marshy spongy places at the banks of streams, plentiful; at the Quiapoze rivulet, without fl. or fr. Nov. 1854. No. **6341**. By streams near Quibige in Sobato de Bumba, sporadic; fl. and fr. May 1855. No. **6342**. At Carengue among the Queta mountains; without fl. or fr. July 1856. Apparently this species. No. **6414**.

It was apparently on the living leaves of No. 6335 that the Fungus n. 2, *Phyllachora irregularis* A. L. Sm. in Journ. Bot. 1898, p. 179, grew among the Alto Queta mountains in March 1856. "N-guiriri" is the native name of a tree referred in Welwitsch's mss. to this species.

The two following Nos. should be compared with this species:—

Golungo Alto.—A small, broadly frondose tree, with the habit of an *Alnus*; trunk and branches lactescent. At the margins of the rivulet Cuango near Canguerasange; without receptacles 25 Sept. 1854. No. **6335*b***.

Golungo Alto.—Fresh leafy shoots from the trunk of a tree burnt down. Near Cimeterio, Sange; without receptacles, middle of Sept. 1855. No. **6408**.

30. **F. sidifolia** Welw. ms. in herb., sp. n.

A huge tree, 30 to 70 ft. high; trunk $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. in diameter, divided a little above the base into tortuous twisted branches, clothed with a reddish ferruginous bark; branchlets smooth, purplish, glabrescent, leafy, hirsute at the apex; leaves alternate, broadly oval or ovate-rotund, unequal-sided, shortly acuminate-apiculate at the apex, deeply cordate at the 5-nerved base, rigidly chartaceous, repand-denticulate, dark green hispid and scabrid above, paler hispid and minutely punctate beneath, 3 to 10 in. long by $2\frac{1}{2}$ to 8 in. broad, deciduous; lateral veins 4 or 5 on each

side in addition to the basal nerves, spreading-ascending, rather slender; petioles more or less hispid, stiff, $1\frac{3}{4}$ to 7 in. long; stipules broadly ovate, cuspidate, hispid at the base and along the midrib, otherwise glabrate, $\frac{3}{8}$ to $\frac{1}{2}$ in. long, caducous; receptacles (according to Welwitsch's ms.) as large as a moderate-sized fig (cf. *F. Carica* L.), somewhat smooth when ripe, peach-coloured reddish, agreeably aromatic, soft, almost edible, scarcely sweet, paniculately clustered on their own branchlets which proceed from the trunk and thicker branches; numerous gall-flowers, several female (perhaps abortive) flowers, and near the apex a few male flowers present in the same receptacle; perianth of the male flowers tripartite, the segments broad imbricate and enveloping the two stamens; filaments short; anthers $\frac{1}{16}$ in. long; perianth of the female flowers with three linear-subulate segments; style lateral, from the top of the ovary, rather long.

Golungo Alto.—At the outskirts of primitive forests near Sange, by the Bango road: Jan. 1856. No. **6407**. No notes. Without receptacles. No. **6421**. A small tree of 6 to 8 ft., perhaps not fully grown; sap watery-viscid; habit of foliage like a *Sida* or *Abutilon*; petioles ranging up to $3\frac{3}{4}$ in. long. At the bushy margins of forests in Sobato de Bango and Sobato de Quilombo, rather sparingly; without receptacles, Dec. 1854. No. **6345**. Leaves very scabrous above; petioles $\frac{3}{4}$ to 3 in. long. By a rivulet in the valley on the northern tract of the Cimeterio near Canguerasange; without receptacles, Oct. 1854. Perhaps a different species. No. **6348**. Receptacle ovoid- or clavate-pyriform, cinnabar-red, juicy, papillose-puberulous outside, $1\frac{1}{4}$ in. long by $\frac{7}{8}$ in. thick, shortly bracteate at the base; ostiole prominent. At Sange; fr. Feb. 1856. Coll. Carp. 898.

The following No. possibly belongs here :—

Island of St. Thomas.—A handsome tree; trunk about 6 ft. in diameter, 25 to 40 ft. high, used for making the negro canoes or small boats; wood smooth, whitish; branches tortuously spreading; head broadly ovoid or hemispherical. In the more elevated forests of the island; without receptacles, Dec. 1860. Called by the inhabitants "Figo porro." No. **6406**.

5. **BOSQUEIA** Dup.-Th. ex Baill. Adansonia iii. p. 338, t. 10 (1863); Benth. & Hook. f. Gen. Pl. iii. p. 370 (*Bosquiea*).

Centrogyne Welw. ex Benth. & Hook. f., *l.c.*

1. **B. angolensis** Ficalho, Pl. Uteis, p. 271 (1884).

Centrogyne angolensis Welw., *l.c.* *B. Welwitschii* Engl. Mon. Morac. African. p. 36 (1898).

Golungo Alto.—A tree, usually 25 to 50 ft. high (a specimen seen near the cataracts of the river Cuango was certainly more than 60 ft. high, with the trunk quite bare of branches up to nearly half its height), sometimes lower; head loosely pyramidal; trunk when old bare below, divaricately branched and frondose above; branches and branchlets spreading or very patent; branchlets ashy or dusky purple, smooth; young parts herbaceous-green or the buds dusky purple; old parts exuding a resinous bitter somewhat caustic and aromatic milk which at first is whitish but quickly coagulates into a rubicund some-

what soft resin ; leaves evergreen, rigidly coriaceous, deep green and glossy above, from yellow to pale green beneath ; midrib yellow ; spaces between the lateral veins pellucidly venulose ; flower-heads solitary, shortly stalked, axillary, enclosed in the bud within the bract-like receptacle ; stalk semi-cylindrical ; receptacle membranous-paleaceous, variously cleft on the margin ; flowers monœcious, apetalous ; male flowers 5 to 7, arranged around the female flower, their perianths membranous-paleaceous ; filaments straight in æstivation, more or less sub-cohering at the base, white, cylindrical-filiform ; anthers oblong, dorsifixed, flesh-coloured-violet or oftener bright deep blue, bilocular ; the cells longitudinally dehiscing, a little diverging below, surmounted at the apex by the subulate apiculus of the connective ; female flower placed in the centre of the receptacle or a little excentric, its perianth short tubular and acutely 5-cleft at the apex ; ovary immersed in the receptacle, unilocular ; ovule solitary, pendulous from the apex of the cell ; style firm, cylindrical, deeply bifurcate at the apex, its branches flattened linear-lanceolate variously twisted rosy-velvety and stigmatose on the inner face ; fruit drupaceous, golden yellow, a little larger than or double the size of the hips of *Rosa canina* L., eaten by the negroes but not much praised ; drupe formed from the baccate receptacle ; seed pendulous ; albumen wanting ; cotyledons comparatively large. The fruit is described in Welwitsch's notes also as like a plum and yellowish red or light yellow-rosy. In primitive forests at the base of Serra de Alto Queta, sporadic, flowering nearly throughout the year, fruiting principally in June ; fl. and fr. May to July 1856. No. **456**. A small tree ; branches and branchlets very patent, almost pendulous, bright purple. In wooded places at the banks of the river Cuango near Sange ; without fl. or fr. Feb. 1855. Foliage rather larger and thinner than in the last no. No. **457**. In dense primitive forests at the great cataract near Sange ; fl.-bud Aug. 1855. No. **458**.

The native name of No. 456 is "Munguenga ià muxito" or "Munguengo ia muchito," which means the Munguenga of the woods; this name according to Ficalho, *l.c.*, is equally applied to *Spondias*, which has a fruit similar in taste : *S. Mombin* L. is called "Muguenga" or "Muguengue." See *ante*, pp. 175, 176. The aspect of this *Bosqueia* is much like that of *Mesogyne insignis* Engl. Bot. Jahrb. xx. p. 148. t. 5, fig. M-V (1894) as judged from the plate quoted. The Orchid *Angræcum Guyonianum* Reichenb. f., *post*, ii. p. 9, grew on "Munguenga ià muxito" ; also the Fungus (?) n. 34, and Fungus n. 79, and probably lichen n. 362.

6. **IPO** Rumph. ex Pers. Syn. Pl. ii. p. 566 (1807).

Antiaris Leschen. in Ann. Mus. Par. xvi. p. 478 (1810); Benth. & Hook. f. Gen. Pl. iii. p. 371.

1. **I. toxicaria** Pers., *l.c.*

Antiaris toxicaria Leschen., *l.c.*, p. 478, t. 22 ; Hook. Camp. Bot. Mag. i. p. 310. t. 17 (1836) ; Engl. Nat. Pflanzenfam. iii. 1, pp. 85, 86, fig. 64 (1888). *A. innoxia* Blume, Rumphia i. p. 172, t. 54 (1835). *A. dubia* Spanoghe in Hook., *l.c.*

Arbor toxicaria macassariensis, Thunb. & Æjmel. Dissert. (21 May, 1788), incorrectly referred to by Pers., *l.c.*, at the end of the volume.

Golungo Alto.—A handsome tree, with the aspect of a huge *Alnus*, 33 to 60 ft. high, sometimes taller and reaching 3 to 3½ ft. in

diameter at the base; head depressed-dilated, very ample, majestic, evergreen; trunk straight, bare of branches to the height of 15 to 20 ft. and there 2 to 2½ ft. in diameter, patently branched above, the lower branches almost horizontal or even drooping, the upper ones erect-spreading, together making up the hemispherical head; branchlets flexuous, tuberculate; leaves coriaceous, more or less shining or varnished-glossy above, paler beneath, when dried almost coppery red beneath; young fruits greenish, tipped with a long bifid style or rarely with several styles; ripe fruits drupaceous, obovoid, shortly pedunculate, coriaceous, mucronate at the apex with the remains of the style, monospermous, softly and slightly velvety, orange-red; embryo large, white; all parts of the tree especially the fruit exuding a viscid resinous whitish milk. All the specimens seen were dicœcious. In the primitive forests of the Alto Queta mountains, sporadic or in some places plentiful; fl. in Feb. and March, young fr. in April and May, ripe fr. in July to middle of Aug., 1855 and 1856, first seen on the northern slopes of Cimeterio do Alto das Cruzes. No. **2593**. A lactescent tree, with the habit of Mucamba-Camba (*Chlorophora excelsa* Welw. herb. no. 1559); fruit ficiform, velvety-scarlet. Cimeterio; fr. July 1857. Coll. Carp. 905.

Welwitsch and his negro servants frequently climbed some of these trees to cut flowers and fruits, but suffered no bad effects.

The leaves in the above No. are entire or somewhat repand but not serrulate, and glabrous or nearly so as well as the branches; but Sir Joseph Hooker in Fl. Brit. Ind. v. pp. 537, 538 (1888) describes the leaves as entire or serrulate scaberulous glabrous or tomentose beneath, and the young leaves as lanceolate serrulate hirsute; and he states that, according to Dalzell, the leaves on the shoots are very different from the old ones, being densely hirsute elliptic-lanceolate caudate-acuminate and serrulate; and that similar but much larger leaves occur in Malayan specimens; the following Nos., therefore, should be compared with this species, and perhaps belong to it:—

Golungo Alto.—A small tree, with similar habit and in company with the above, near Sange, but never seen to flower, July 1855. No. **2595**. A tree, 8 to 10 ft. high, perhaps a young state of a larger tree, copiously lactescent. In damp forests at the cataracts of the river Cuango, near Sange, sporadic; the trees were never seen to flower, though Welwitsch lived near them for months, Aug. 1855. Negro name "N-dua." No. **1232**. A tree, 6 ft. high, probably young, with the habit of a *Ficus*. In the secondary woods of the Central Queta mountains; without fl. or fr. June 1856. No. **1232***b*.

7. **ARTOCARPUS** J. R. & G. Forst. Char. Gen. Pl. p. 101. tt. 51. 51*a* (1776); Benth. & Hook. f. Gen. Pl. iii. p. 376.

Soccus Rumph. ex Forst., *l.c.*, p. 102. *Rima* Sonner. Voy. Nouv. Guin. p. 99. tt. 57–60 (1776). *Rademachia* Thunb. in Vet. Acad. Handl. Stockh. xxxvii. p. 250 (1776).

Forsters' genus is probably anterior to the names of Sonnerat or Thunberg, for the preface to their book is dated November 1775; Thunberg's appeared in the last quarter of 1776.

1. **A. communis** J. R. & G. Forst., *l.c.*, p. 102.

Rademachia incisa Thunb., *l.c.*, p. 253. *A. incisus* L. f. Suppl. Pl. p. 411 (1781); Welw. Apontam. p. 546, sub n. 69 (1859) (*incisa*); Ficalho, Pl. Uteis, p. 273 (1884); Engler, Nat.

Pflanzenfam. iii. 1, pp. 82, 83, fig. 61 (1888); Engl. Mon. Morac. African. p. 35 (1898). *Sitodium altile* S. Parkins. Journ. South Seas, p. 45 (1784). *Saccus communis* O. Kuntze, Rev. Gen. Pl. ii. p. 633 (1891).

Sierra Leone.—Cultivated in several gardens at Freetown, where Welwitsch took the opportunity of eating the savoury cooked fruit, Sept. 1853; he recommended its re-introduction and general cultivation in Angola. No. **2585** (no specimens).

The fruit is cut into slices and baked in Jinguba oil, that is, the oil extracted from the seeds of *Arachis hypogæa* L., *ante*, p. 239.

2. **A. integrifolia** L. f., *l.c.*, p. 412; Ficalho, *l.c.*, p. 272; Engl. Mon., *l.c.* (*integrifolius*).

Rademachia integra Thunb., *l.c.*, p. 254. *Sitodium cauliflorum* Gærtn. Fruct. i. p. 345, tt. 71, 72 (1788). *A. jaca* Lam. Encycl. Méth. iii. p. 209 (1789). *Saccus integer* O. Kuntze, *l.c.*

Island of St. Thomas.—Wild here and there, and cultivated in both the coast and mountain regions of the island; ripe fr. Dec. 1860. No. **2586**. The fruit (syncarpium) is brought to market whole, and is often much larger than a man's head, green on the outside with a soft rind; the interior is full of a soft pulp (like half-baked bread), in which the seeds are embedded; the seeds are about an inch long. The fruit is sliced and cooked in oil like the last species, which, however, makes a preferable dish. The inhabitants call the tree "Jaca" or "Jacca."

Lichen n. 141 grew on the trunk of this tree on Pico de Papagaio in Prince's Island in Sept. 1853.

8. **TRECULIA** Decaisne; Benth. & Hook. f. Gen. Pl. iii. p. 374. *Myriopeltis* Welw. ex Hook. f. in Bot. Mag. t. 5986 (1872); and ex Ficalho, Pl. Uteis, p. 272 (1884).

1. **T. africana** Decaisne ex Tréc. in Ann. Sc. Nat., ser. 3, viii. p. 109, t. 3. figs. 86–99 (1847); Hook. f., *l.c.*; Ficalho, Pl. Uteis, *l.c.*; Henriques, Bol. Soc. Brot. x. p. 162 (1893); Engl. Mon. Morac. African. p. 32, tt. 12, 13 and 14, fig. B (1898).

Myriopeltis edulis Welw., *l.c.*; and ex Ficalho, *l.c.* *Ficus Welwitschii* (Miquel ms.) Hort. Kew. ex Hook, f., *l.c.*; non Warb.

Barra do Dande.—A tree about 25 ft. high; leaves rather shorter and comparatively broader than in the type, about 7½ in. long by 4 in. broad, in shape almost like those of *Artocarpus integrifolia* L. f. Cultivated in plantations of "Bombo" (cf. mandioc) on Fazenda do Bombo, on the right bank of the river Dande, about 500 ft. elevation, where it is said to have been formerly introduced by Pedro Alexandrino from the island of St. Thomas; without fl. or fr., Sept. 1858. No. **2588**.

Golungo Alto.—A handsome, stout, lofty tree, 35 to 80 ft. high, exuding a whitish milk; trunk straight, 1 to 2 ft. in diameter at the base, bare below up to two-thirds of its height, in consequence of the gradual falling away of the branches, loosely branched above; branches spreading almost horizontal or deflected-patent, strong, long, tortuous; the younger branchlets atropurpureous; leaves coriaceous, bright green, glossy, paler beneath, atropurpureous on the midrib; flowers white, diœcious; heads of male flowers mostly spherical or slightly

ellipsoidal, as large as a man's fist or usually a little larger than a goose's egg and more globose, 1⅔ to 2¼ in. in diameter when green, beset with peltate very densely aggregated scales from the clefts or inter-substance of which the antheriferous filaments emerge; perianth usually bifid; the lobes erect, ovate or ovate-lanceolate, ciliolate on the margin, a little thickened and somewhat fleshy below, whitish green; stamens always 2 in the flowers examined, opposite the perianth-lobes; filaments exserted, fleshy, straight; anthers arcuate-oblong, dorsifixed, comparatively large, persistent, sweetly fragrant, hard, somewhat rigid, turning snow-white in drying; pollen copious; fruit a syncarpium, immense, as large as a man's head, or twice as large, or the size of a large pine-apple (one of the fruits brought in July from the Queta mountains, the largest of 6, but still green outside and consequently not quite ripe, measured a yard in vertical circumference), when ripe yellowish outside, very rough, agreeably sweet-scented and somewhat acidulous or vinous-aromatic, almost resembling a gigantic lemon, ellipsoidal; interior receptacle central, spherical, hard, woody, bearing elongate-cuneate scales which are roundly peltate at the surface of the fruit and among the viscid pulpy shafts of which the seeds are compactly embedded; seeds very numerous in the syncarpium, more than 1500 in a single one, edible when cooked, as large as those of *Pinus Pinea* L. and not dissimilar in taste, sometimes boiled, sometimes roasted or prepared like sweetmeats, and so eaten by negroes, especially by the Mahungos, and also by the colonists, and used in the preparation of a kind of almond-milk which is truly refreshing drink in these hot countries, and alleviates in a very great degree the thirst of those stricken down with fever. In the denser damp slopes of the primitive forests of the Alto Queta mountains, about Sange, Bango, N-delle, etc., and at the banks of the river Luinha, in deep valleys, not plentiful; male fl., April and May 1855, and from Nov. 1855 to Jan. 1856; ripe fr. beginning of April and beginning of Aug. 1855 and Jan. 1856; seedling, Feb. 1856. Native name "Dizanha." No. **2587** and Coll. Carp. 902 to 904.

Pungo Andongo.—A small tree, 10 to 15 ft. high. At the banks of the river Cuanza, fr. March 1857. Coll. Carp. 1015*b*.

Island of St. Thomas.—A tree, 25 to 35 ft. high; head elongated, interrupted, evergreen; branches patent; fruit spherical or ellipsoidal, very minutely scutellate outside, as large as a moderate-sized pumpkin or as a human head or larger; seeds cooked by the negroes and dried, edible, numerous in the syncarpium, about 1000 to 1200, embedded horizontally in white and spongy pulp, well tasted. In the denser damper forests of the island, up to elevation of 2500 ft., wild, and on account of its savoury fruit occasionally cultivated; fr. Dec. 1860. Native names "Isa," "Isaquente," "Quicange," "Giquenge," or "Gicuenge." No. **2589** and Coll. Carp. 20.

In Senegambia it is called "Okwa" or "Ocua." It is mentioned by Welwitsch in Synopse Explic. p. 54, n. 142 (1862), under the name of "Amendoas de Disanha" (Disanha almonds); the fruit is described as having the shape and size of a small "abobora chila" (*Cucurbita ficifolia* Bouché, *ante*, p. 402; Welw. herb. no. 834 and Coll. Carp. 142); the seeds are frequently sold in the market in the island of St. Thomas, where they are bought for food.

The fungus n. 73, the moss n. 148*b*, the hepatic n. 302, and the lichens nn. 97, 180, 305, and 434, grew on the trunk branches or leaves of Dizanha in Serra de Alto Queta and in other parts of Golungo Alto. *Carpolobia alba* G. Don (*ante*, p. 48) grew under the shade of this tree then in flower-bud at the end of Oct. 1855.

This is the rather thick tree, 30 ft. high, with large fruit and edible seed, noticed by J. R. T. Vogel by the river Niger, 16 Sept. 1841, and called by the Kroomen "Oqua." See Niger Flora, pp. 67, 68, 525 (1849). In the island of St. Thomas, the name "Oca" or "Oqua," is used to designate *Ceiba Casearia* Medic., *ante*, pp. 80, 81.

9. **TRYMATOCOCCUS** Poepp. & Endl.; Benth. & Hook. f. Gen. Pl. iii. p. 366.

1. **T. kamerunianus** Engl. Mon. Mor. Afr. p. 29. t. 11, B (1898). *Dorstenia kameruniana* Engl. Bot. Jahrb. xx. p. 142 (1894).

Var. **Welwitschii** Engl. Mon., *l.c.*

Trymatococcus sp., Welw. in Trans. Linn. Soc. xxvii. p. 61 (1869).

Golungo Alto.—A shrub or low tree, 4 to 8 ft. high, erect, sparingly but really lactescent; stem branching a little above the base; branches sparse, virgate, patent, elongated, slender; leaves large, elliptical, long-acuminate, slightly rough, evergreen, subcoriaceous, dark green and glossy (the older ones opaque) above, pale green beneath; receptacles on erect axillary stalks, solitary or 2 or 3 together, ob-pyramidal, embedded in pulp, the young ones capituliform, involucrate with 5 to 7 broadly ovate acuminate green scales, which are fringed on the red margin and converge adpressedly at the top of the capitulum; the scales at the time of the flowering mostly deciduous, one or two afterwards conspicuous at the outer face of the receptacle, and the top of the capitulum spreading into a circular somewhat flat whitish fleshy torus, the margin more or less unequally erose-undulate or crenulate. The male flowers very numerous, at first 5 of them appearing around the female flower, afterwards always in a greater number, and finally covering the whole plane of the receptacle, each of them consisting of a very short cylindrical tube, entire at the mouth, from the bottom of which rises the single whitish somewhat fleshy stamen; anther didymous, whitish, quickly turning dusky. The female flower solitary, central, consisting of an ovoid ovary, with a style bifid at the apex and only the flattened lobes exserted, sessile at the base of the receptacle, and rising through the cavity of the fleshy torus to its surface. In very dense exceedingly shady primitive forests, preferring the neighbourhood of streams, especially about the Capopa cataract, between Sange and N-delle, plentiful; fl. abundant throughout the year, fr. only seen on one branch, 4 Oct. 1854 and June and Aug. 1855 and 1856. No. **2594**.

This is the plant mentioned by Welwitsch in Journ. Linn. Soc. iii. p. 151 (1859) as a genus nearly related to *Dorstenia* and as a large woody shrub 4 ft. high, in general habit like a fig, but with the receptacles obconic truncate and open, just as in *Kosaria*. Lichen n. 477 grew on the leaves of this shrub at Capopa in the spring and summer of 1855; and the fungus n. 508 about its branchlets.

Brunnichia africana Welw. herb. no. 1754 (*ante*, pp. 905, 906) grew in company with the *Trymatococcus*; also a scarlet-flowered Ochnacea (cf. *Ochna membranacea* Oliv., var. *rubescens*; *ante*, p. 120), and Combretaceæ with velvety fruit (cf. *Combretum paradoxum* Welw. herb. no. 4385, *ante*, p. 350).

It is, perhaps, the "Matomba," which Welwitsch in his mss. says is the name of a small or middle-sized tree, belonging to this group of plants, and that with it the negroes in the district of Cazengo make very strong cords. In Barra do Dande the name "Matombe" is used for *Raphia textilis* Welw.

10. **DORSTENIA** Plum., L.; Benth. & Hook. f. Gen. Pl. iii. p. 366.

1. **D.** (Sychinium) **Psilurus** Welw. in Trans. Linn. Soc. xxvii. p. 71 (1869); Bureau in DC. Prodr. xvii. p. 272 (1873), excl. var. *scabra*; Ficalho, Pl. Uteis, p. 269 (1884); Engler, Bot. Jahrb. xx., 1, p. 140. n. 5 (1894), and Mon. Morac. Afric. p. 20 (1898); De Wild. & Dur. Pl. Thonner. Congol. p. 10 (1900).

Pungo Andongo.—A perennial, caulescent herb, 2 to 2½ ft. high; rhizome tuberous, after the manner of *Dentaria*, very pleasantly aromatic; leaves membranous, almost like those of *Artocarpus communis* Forst.; receptacle with 1 or 2 long tails; stamen 1; filament somewhat compressed; achenes crustaceous; style adpressed to the achene after fertilization, bifid at the apex; seed parietal, attached at the upper part of the fruit-cavity; testa membranous; umbilicus rather broad, flat, orbicular; albumen scarcely including the whole of the embryo; cotyledons obovate, slightly veined. In narrow moist deep very shady valleys at the fissures of rocks in Mata de Pungo in the præsidium, not uncommon; fl. and fr. end of Dec. 1856 and Jan. and Feb. 1857. No. **1564**.

The Fungi, nn. 8 *Æcidium* sp., Welw. & Curr. in Trans. Linn. Soc. xxvi. p. 293 (1868), and 184 *Puccinia* (vel *Uromyces?*) *Dorsteniæ* Lagerh. in Bol. Soc. Brot. vii. pp. 130, 131 (1889), grew on the leaves of this plant.

The following No. is without fl. or fr.; it was considered by Welwitsch to belong to the same species:—

Golungo Alto.—A herb, a foot high, with a tuberous root. In the very shady parts of the Quisucula primitive forest near Bango, Feb. 1855 and May 1856, very sporadic. No. **1563**.

2. **D.** (Kosaria) **vivipara** Welw., *l.c.*, p. 70; Bureau, *l.c.*, p. 273; Engler, *ll.cc.*, p. 141. n. 13, & p. 21.

Pungo Andongo.—A perennial herb, 6 to 9 in. high, bulbiferous in the axils of the lower leaves; bulbils lactescent, viviparous; stems ascending, weak, very brittle, cylindrical, thinly puberulous, lactescent; leaves membranous, thinly fleshy, slow and difficult to dry, puberulous, herbaceous-green above, pallid greenish beneath; receptacles on long stalks in the axils of the upper leaves, cyathimorphous, somewhat fleshy, lactescent, many-flowered, 6- to 8- or rarely 9-radiate on the margin or limb, the rays more or less patent or erect-spreading; flowers embedded in the somewhat fleshy margined pits of the receptacle, the male ones superficial inserted on the disk of the receptacle and mixed with the styles of the female ones, the styles bursting from the body of the receptacle through a disciform diaphragm; ovaries fleshy-gelatinous, 1-celled, irregularly hidden in the body of the somewhat succulent receptacle, showing only the stigmas on the surface of the disk, at length projecting in an elastic manner the seed from a gaping chink; seed ovoid-angular, obscurely trigonous, papillose, not hooked. In remarkably shady places at the sides of the rivulet Candange Camatuta and in the præsidium; plentiful but only in a few spots; fl. and fr. middle of Dec. 1856, and Jan. and Feb. 1857. No. **1565**.

3. **D.** (Kosaria) **benguellensis** Welw., *l.c.*, p. 71; Bureau, *l.c.*, p. 274; Engl. Mon. Morac. African. p. 24 (1898).

Huilla.—An erect, perennial herb, ½ to 2 ft. high; root large,

tuberous, succulent, watery, edible, delightfully refreshing; stem lactescent, scarcely branched or furnished with abbreviated leafy branchlets, fleshy, cylindrical, somewhat reddish; leaves lactescent, elliptic-lanceolate, somewhat fleshy, veined, the veins impressed on the upper face, raised on the lower; flowers clustered on the hemispherical receptacle. In sandy thickets among low herbs near Lopollo, sparingly and sporadic; fl. and few fr. 25 Dec. 1859. No. **1566**.

In some respects allied to *D. indica* Wall. List, n. 4639 (1831), but the leaves are subsessile, and it can be easily distinguished by the tuberous root. *D. indica* is reported to have been collected by Mr. Last at the Usagara district of Central Africa: see Mitten in Journ. Linn. Soc. xxii. p. 299 (1886); but this distribution of the species is not recognised in Hook. f. Fl. Brit. Ind. v. p. 494 (1888).

11. **CHLOROPHORA** Gaudich. Bot. Voy. Freyc. p. 509 (1826); Benth. & Hook. f. Gen. Pl. iii. p. 363.

1. **C. excelsa** Benth. & Hook. f., *l.c.*; Ficalho, Pl. Uteis, p. 268 (1884); Engl. in Notizbl. Bot. Berlin ii. p. 52 (1898), Mon. Morac. African. p. 3 (1898).

Morus sp. Welw. Synopse Explic. p. 8. n. 6. & p. 9. n. 14 (1862). *M. excelsa* Welw. in Trans. Linn. Soc. xxvii. p. 69. t. 23 (1869). *Maclura? excelsa* Bureau in DC. Prodr. xvii. p. 231 (1873).

Golungo Alto.—A very lofty, immense, copiously lactescent tree, 100 to 135 ft. high; trunk 4 to 7½ ft. in diameter at the base, losing its branches more or less up to two-thirds of its height; head ample, hemispherical; timber whitish, soon becoming pale bay in colour, durable, very highly valued, easy to work, used for house-building, gates, doors, tables, etc.; branches patent; branchlets nodose, somewhat tortuous, quasi-scarred with short whitish lines; flowering shoots green; leaves deciduous, the fresh ones appearing with the flowers in October and November, falling in the following June, July and August, somewhat glossy and marked with deep green yellowish veins above, yellow-greenish and pervaded with more deeply yellow veins beneath, densely pubescent almost tomentose in the young state, the adult ones glabrous, very delicately and beautifully reticulate, toughly membranous almost coriaceous, those of the young trees much larger than those of old ones; petioles slightly channelled; flowers dicœcious, appearing only on old trees; fruit when nearly ripe from greenish to yellowish, but little juicy. In primitive forests, on the lower slopes of the Queta mountains near Canguerasange and around Bango, on a mica-schist formation, with foliage, Oct. 1854; Bango road, July 1855; Queta mountains, beginning of Oct. 1855; near Sange, N-delle, Mata de Quibange, etc., plentiful, fl. Nov. 1855, fr. Dec. 1855 to Feb.; on the slopes of Alto Queta, plentiful, male fl. end of Sept. 1856; Mata de Quilango near Sange, fr. Dec. 1855. Native name "Camba-Camba" or "Mucamba-Camba"; colonial name "Amoreira" or "Moreira." It is milky in all parts after the fashion of the Figs. No. **1559**, and Coll. Carp. 897.

This is the tree referred to by Welwitsch, Apontam. p. 546 sub n. 68 (1859), as a new genus allied to *Morus*. The moss n. 132, *Schlotheimia rugifolia* Brid. grew on the trunk of "Mucamba-Camba" at Sange in Dec. 1854.

2. **C. tenuifolia** Engl. Bot. Jahrb. xx., 1, p. 139 (16 Nov. 1894), and Mon. Morac. African. p. 4 (1898).

Island of St. Thomas.—A young tree, 4 to 5 ft. high. In wooded places about Fazenda do Monte Caffé, at an elevation of 1200 ft.; without fl. or fr. Dec. 1860, called "Amoreira." No. **1560**. Branchlet of a more adult tree, given to Welwitsch by his friend, Senhor Carvalho, under the name of "Moreira;" at Fazenda do Monte Caffé, without fl. or fr. Dec. 1860. No. **1561**.

These determinations are doubtful; I have not seen the type of Engler's species. Welwitsch thought that No. 1560 might be a young state of the previous species, and Ficalho, *l.c.*, appears to refer to these Nos. and to confirm Welwitsch's opinion.

12. **MORUS** Tournef. L.; Benth. & Hook. f. Gen. Pl. iii. p. 364.

1. **M. nigra** L. Sp. Pl., edit. 1, p. 986 (1753); Bureau in DC. Prodr. xvii. p. 238 (1873); Ficalho, Pl. Uteis p. 269 (1884); Engl. Mon. Morac. Afric. p. 3 (1898).

Mossamedes.—A much branched tree, 20 ft. high; fruit blackish purple, small, of moderate worth; leaves smoother than usual in the type of the species; petioles ½ to 1½ in. long. Cultivated in gardens in the district; at Cavalheiros at the banks of the river Bero, about three miles from Mossamedes towards the east; with almost ripe fr. July 1859. No. **1562**.

CXVIII. ULMACEÆ.

1. **CELTIS** Tournef. L.; Benth. & Hook. f. Gen. Pl. iii. p. 354.

1. **C. Henriquesii** Engl. in Berlin Notizblatt, iii. p. 22 (1900).
Celtis sp., Ficalho, Pl. Uteis, p. 260 (1884).

Golungo Alto.—A lofty tree, 60 to 100 ft. high; trunk straight, 1½ ft. in diameter at its base and almost as thick for two-thirds of its height; bark grey; wood excellent; leaves scabrid, caducous at the time of the flowering; drupes apparently smooth, without any ribs. In elevated forests among the Queta mountains, often forming the bulk of the forest with its dense mass of trunks, at N-delle; fl. and fr. beginning of May 1856. Native name "Quibâba." No. **6286**. By the king's highway towards Ponte de Felix Simões, near Sange; without fl. or fr. 1854. Apparently this species. No. **6264**. At Quibolo; fresh branches of a burnt tree, without fl. or fr. June 1856. Apparently this species. No. **6263**.

Bumbo.—A handsome tree, with a straight trunk and widely spreading somewhat lax head. In rather elevated primitive forests in Serra da Xella, intermixed with various other trees; fl. Oct. 1859. No. **6308**. A lofty tree, more than 40 ft. high, with a broad head. In the forests of Serra da Xella, a little above the place where the flowering specimens of the previous No. were collected on the same day; in fr. No. **6307**.

The fungus n. 396 at Quibolo in April 1856 grew on the trunks of apparently this species.

The following No. should be compared with this species:—

Golungo Alto.—A patently branched shrub of 3 to 4 ft., perhaps a young tree; leaves like those of a *Celtis*. In secondary thickets on the left bank of the river Cuango, near Cacarambola; without fl. or fr. beginning of Dec. 1855. No. **6306**.

2. **C. Soyauxii** Engl., *l.c.*, p. 23.

Trema sp., Ficalho, Pl. Uteis, p. 260 (1884).

Golungo Alto.—A tree, 40 to 80 ft. high ; trunk bare of branches below, above terminating in an ovoid head ; timber whitish, straight, strong, very useful, called by the negroes "Páo Cababa" or "Quibaba." In the primitive forests of Sobato Cabanga-Cacalungo ; fr. 3 Feb. 1855. No. **6285**. A tree, 20 to 40 ft. high ; trunk 8 in. in diameter at the base or more ; branches slender, as well as the branchlets erect-spreading, dusky-grey, punctate with very small white warts ; leaves rigid, dark-green above, paler beneath, thick but not fleshy, coriaceous or scarcely so ; fruit on axillary solitary simple or rather dichotomous peduncles ; unripe fruit green, ovoid-compressed or tetragonal-pyramidal, quadricostate (two of the ribs less prominent than the others), crowned at the apex with two bifid connivent styles or stigmas or with their remains (the stigmatic lobes divaricate) ; young seed pendulous from the top of much larger cavity of the young fruit ; ripe fruit cinnabar-red, drupaceous, juicy, monopyrenous ; seed bony, quadricostate, cotyledons plicate ; radicle thick. In hilly bushy places in Sobato Bumba, near Bumba, fr. 2 May 1855 ; also at the outskirts of forests among the Bango and Queta mountains, fl. and young fr. 12 Nov. 1855. Native name "Quibâba." No. **6298**. In fl.-bud and young fr. No. **6299**. Without fl. or fr. Apparently this species. No. **6300**. In fr. Determination doubtful (cf. *Rinorea*). No. **6711**.

Cazengo.—In the Cacula forests ; fr. June 1855. No. **6284**.

The following No. should be compared with this species :—

Island of St. Thomas.—Called "Capitão." Without fl. or fr. No. **6303**. "Capitão" is used for joinery, turning, and building (see Cat. Exposit. Paris 1867, sect. Portug. p. 427 n. 14).

"Quibâba roxa" or Red Quibaba is a tree 60 to 100 ft. high, which grows in groups constituting the bulk of forests and forms one of the finest ornaments of the virgin forests of Golungo Alto and Cazengo ; its trunk is always straight, and not uncommonly attains a height of 60 ft. and more, nearly cylindrical to the height often of 40 ft., with a diameter from 2 to $2\frac{1}{2}$ ft. at the base ; the bark is whitish grey, and the wood is nearly but not quite always cherry-red or blood-red in the middle and white towards the outside ; the head is rather lax, and the leaves variable in shape and substance. Welwitsch had no opportunity of witnessing any application of it made by the natives ; he regarded it as a new species of *Sponia* (see Welw. Synopse Explic. p. 12. n. 25 [1862]). It doubtless is this and possibly also the previous species of *Celtis*. The "Quibaba" of Mussengue or of Hungo is *Khaya anthotheca* C.DC. ; *ante*, p. 135. The "Quibâba" of Queta or "Quibâba quina" is *Entandrophragma angolense* C.DC. ; *ante*, p. 136. "Quibeba" is *Ficus Quibeba* Welw. herb. no. 6399. The Bunda name "Quibâba," plural "Ibâba," signifies in general the bark of any tree whatever, and is used in Golungo Alto for trees of quite distinct families. It was probably on the branchlets of the heads of this tree that the lichen n. 156, *Placodium Brebissonii*, var. *microspora* Wain., grew in the Sange forests in April 1856 ; also lichen nn. 203 and 204.

3. **C. Prantlii** Priemer in Berlin Notizbl. iii. p. 23 (1900).

Libongo.—A tree, 20 to 30 ft. high, sometimes only 15 ft. ; head wide ; branches spreading ; branchlets crowded, somewhat drooping ; leaves coriaceous, shining, trinerved after the fashion of the Melastomaceæ. In rather dense forests at the banks of the river Lifune near the petroleum mine, sparingly ; fr. end of Sept. 1858. No. **6302**.

Cazengo.—A tree, 20 to 25 ft. high; bark whitish-grey; branches patent; leaves dryly coriaceous, hard, glossy above; drupe green, crowned with the bifid style or its remains; the style-branches bipartite, stigmatose on the inner side; cotyledons large, incumbent. In dense forests near Cacula; fr. June 1855. No. **6287**.

Perhaps scarcely distinct from *C. philippensis* Blanco, Fl. Filip. p. 197.

4. **C. Wightii** Planch. in Ann. Sc. Nat., sér. 3, x. p. 307 (1848); Wight, Ic. Pl. Ind. Or. vi. p. 8. t. 1969 (March 1853); Henriques, Bol. Soc. Brot. x. p. 161 (1893).

Celtis sp., Planch. in DC. Prodr. xvii. p. 186 (1873).

Island of St. Thomas.—A handsome tree, with strict trunk and white wood. In mountain forests between the town and Monte Caffé, at an elevation from 1800 to 2000 ft.; fr. Dec. 1860. Negro name "Coaco branco." No. **6304**.

This is apparently the same species as a plant collected by G. Don in St. Thomas's Island, and mentioned by Planchon and Henriques, *ll.cc.*; the leaves in Welwitsch's specimen are, however, rather smaller, about 3 in. long by an inch broad; the fruit is about $\frac{1}{2}$ in. broad, $1\frac{1}{3}$ in. long, $\frac{1}{4}$ in. thick. Don's plant has been considered by Henriques, *l.c.*, as the same species as Wight's Indian plant, and therefore Welwitsch's specimen should probably be referred to the same, as given above. Hook. f. in Fl. Brit. Ind. v. p. 483 (Dec. 1888) suspected that *C. philippensis* is not distinct from *C. Wightii*.

2. **TREMA** Lour.; Benth. & Hook. f. Gen. Pl. iii. p. 355.

1. **T. affinis** Blume, Mus. Bot. Lugd.-Bat. ii. p. 58 (1856).

Celtis Guineensis Schum. & Thonn. in Danske Vid. Selsk. iii. p. 180 (1828). *Sponia africana* Planch. in Ann. Sc. Nat., ser. 3, x. p. 320 (1848). *S. strigosa* Planch., *l.c.* *S. affinis* Planch., *l.c.*, p. 329. *S. guineensis* Planch. in DC. Prodr. xvii. p. 197 (1873). *T. guineensis* Ficalho, Pl. Uteis, p. 261 (1884).

Sierra Leone.—In fl. beginning of Sept. 1853. No. **6297**.

Golungo Alto.—A small tree, 10 to 20 ft. high, with the habit of a *Celtis*. At the outskirts of forests near Trombeta; fl. and unripe fr. Sept. 1854. No. **6257**. A small tree, 8 to 20 ft. high, with drooping branchlets. At Menha Lula; fl. May 1855. No. **6262**. A small, patently branched tree, 6 to 10 ft. high. At Molemba-Alcundra near Sange; without fl. or fr. Sept. 1856. No. **6293**. Without fl. or fr. No. **6280***b*.

Cazengo.—A small tree, 12 ft. high, divaricately branched at the apex; branchlets drooping; unripe drupes greenish. By thickets close to the base of the Muxaula mountains; fr. Dec. 1854. From the wood of this tree the musical instrument called "samba-viola" is made. The Cabinda name of the tree is "Musamba-Samba." No. **6280**.

Ambaca.—A small, patently and virgately branched tree, 10 ft. high; branchlets nodding. In moist places by thickets, on the left bank of the river Carenga; unripe fr. June 1855. No. **6281**.

Bumbo.—A frondose tree, about 15 ft. high. In shady primitive forests between Chão da Xella and Cume da Serra, about two-thirds way to the top and near Bumbo, rather rare; in company with *Assonia* (cf. *A. Schimperiana* O. Kuntze, var. *lobulata*; Welw. herb. no. 4729) and *Briedelia* (cf. *B. speciosa* Muell. arg.; Welw. herb. no. 371); fl. and fr. Oct. 1859. No. **6288**.

Island of St. Thomas.—A tree of moderate size; the wood is

used for various building purposes; fl. and fr. Dec. 1860. Local name "Cabra." No. **6282**.

I follow Bentham in Hook. Niger Fl. p. 525 (1849) in uniting *Celtis guineensis* with *Sponia affinis*.

3. **CHÆTACHME** Planch. in Ann. Sc. Nat., ser 3, x. pp. 266, 340 (1848); Benth. & Hook. f. Gen. Pl. iii. p. 356 (*Chætacme*).

1. **C. aristata** Planch., *l.c.*, p. 341, and in DC. Prodr. xvii. p. 210 (1873) (*Chætacme*).

Celtis appendiculata E. Meyer in Flora, 1843, Bes. Beig. ii. pp. 127, 171, name only. *Celtis subdentata* E. Meyer, *l.c.*, pp. 134, 159, 171, name only. *Celtis aristata* E. Meyer, *l.c.*, pp. 151, 171, name only. *Chætachme nitida* Pl. & Harv. in Harv. Thes. Cap. i. p. 16. t. 25 (1859). *Ch. Meyeri* Harv., *l.c.*

Ambaca.—A much branched, very rigid shrub, 6 to 8 ft. high; stems shortly sarmentose, subscandent; branchlets variously arranged, some of them reduced to reddish spines; leaves coriaceous, very rigid, deciduous at the time of the flowering; flowers small, whitish, pentamerous. In bushy places by streams, near Cabinda and Izanga, sparingly; not yet in fully expanded fl. Oct. 1856. No. **474**.

Pungo Andongo.—A handsome tree, 25 ft. high when fully developed, with the habit of an *Olea* or of a *Briedelia*; head dense; branches and branchlets furnished with hard spines; leaves rigidly coriaceous, strongly shining, always densely and pinnately veined and impressedly venulose between the veins above as well as beneath, pallid beneath: flowers greenish-yellowish. In small woods by the gigantic rocks of Cabondo, fl.-bud Nov. 1856; also wooded rocky parts of Mata de Cabondo and near Luxillo, everywhere sporadic; fl. Jan. and March 1857. No. **473**.

Bumbo.—A tree, 15 to 25 ft. high, with the habit of a *Rhamnus*, distantly and irregularly branched; branchlets occasionally spiny; flowers yellowish or greenish; drupes rubicund. In the shady rather elevated forests of Serra da Xella, 15° S. Lat., about 3000 ft. alt., rather rare; with few fl. and very few fr. Oct. 1859. No. **472**.

The fungus n. 171 grew on this shrub about Cabinda in Oct. 1856.

CXIX. MYRICACEÆ.

MYRICA L.; Benth. & Hook. f. Gen. Pl. iii. p. 400.

1. **M. cordifolia** L. Sp. Pl. edit. 1, p. 1025 (1753); Cas. DC. Prodr. xvi. 2, p. 148 (1864).

Cape of Good Hope.—In fr. 1858. Coll. Carp. 906.

CXX. SALICINEÆ.

SALIX Tournef., L.; Benth. & Hook. f. Gen. Pl. iii. p. 411.

1. **S. subserrata** Willd. Sp. Pl. iv. p. 671 (1806).

S. safsaf bælledi Forsk. Fl. Ægypt.-Arab. p. lxxvi (1775) without description. *S. Safsaf* Anderss. in DC. Prodr. xvi. 2, p. 196 (1868).

Bumbo.—A tree, 10 to 12 ft. high; trunk 3 in. in diameter; branches patent; branchlets reddish, more or less brittle; leaves bright green above, whitish beneath. In wooded places by streams

at the base of Serra de Xella, near Bumbo, plentiful ; without fl. or fr. Oct. 1859. No. **6334.** At a stream in Chão da Xella ; male fl. Oct. 1859, in company with *Vernonia podocoma* Schultz Bip. (Welw. herb. no. 3263 ; *ante*, p. 539). No. **6332***b*.

Huilla.—An arborescent, virgately branched shrub ; branches and branchlets reddish yolk of egg coloured ; leaves herbaceous-green and somewhat shining above, whitish beneath ; stamens 6 or rarely 7 ; filaments monadelphous at the very base. At the banks of rivers and streams about Lopollo, Monino, and the Ivantâla lake, plentiful, about 3000 to 4000 ft. alt., in company with species of *Eugenia* (cf. *E. guineensis*, var. *huillensis*, Welw. herb. no. 4403), *Nesæa passerinoides* Koehne (cf. Welw. herb. no. 2336), and a Proteacea, *Faurea saligna* Harv. (Welw. herb. no. 1592) ; male fl. Jan. and March 1860 ; female fl. and fr. April 1860. The shrub rather rarely fruits, for staminiferous specimens were frequently seen all the way from Bumbo to the Ivantâla lake, but pistilliferous ones only in one place, namely at Monino. No. **6332**. In wooded places at Monino by streams, in company with the willow-like Proteacea, *Faurea saligna* Harv. (Welw. herb. no. 1592) ; fr. March 1860. It is singular that the leaves on the shoots which bear the female catkins are always more or less obtuse at the apex, while the rest of the leaves on the same branches have a long acumen like those on the male plants. No. **6333**.

CXXI. CERATOPHYLLEÆ.

1. **CERATOPHYLLUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 415.

1. **C. demersum** L. Sp. Pl., edit. 1, p. 992 (1753) ; Caruel in Nuovo Giorn. Bot. Ital. viii. p. 28. t. 3 (Jan. 1876).

C. vulgare Schleid. in Linnaea xi. p. 540. t. 11 (1837) ; Benth. in Hook. Niger Fl. p. 525 (1849).

Barra do Dande.—Leaf-segments toothed. In pools at the river Dande, without fl. or fr., rather rare, Nov. 1853, in company with *Pistia Stratiotes* L., var. *obcordata* Engl. (cf. *post*, ii. p. 85), and another aquatic plant with a Myriophyllaceous habit. No. **524**.

Barra do Bengo.—A form with the leaf-segments strongly toothed. In the large lake called Lagoa de Quifandongo, at the mouth of the river Bengo, without fl. or fr. Dec. 1853, in company with *Najas Welwitschii* Rendle, *post*, ii. p. 95 (1899), Welw. herb. no. 247. No. **525**.

Icolo e Bengo.—Leaf-segments somewhat toothed. In the large lake called Lagoa de Quilunda, without fl. or fr. 14 Sept. 1854, in company with *Castalia mystica* Salisb., var. *dentata* (Welw. herb. no. 1168 ; *ante*, pp. 22, xxvi), *Pistia Stratiotes* L. (Welw. herb. no. 214), *Lemna paucicostata* Hegelm. (Welw. herb. no. 213 ; *post*, ii. p. 91), and *Wolffia Michelii* Schleid. (Welw. herb. no. 211 ; *post*, ii. p. 92). No. **524***b*.

Pungo Andongo.—Leaf-segments somewhat toothed ; fruit ¼ in. long, surmounted with a slender style about the same length, long-spurred near the base. In the river Cuije not far from its junction with the river Cuanza, also near Sansamanda on the Cuanza, plentiful, fl. and fr. March 1857, in company with *Castalia mystica* Salisb., var. *dentata* (Welw. herb. no. 1165, and *Azolla* (Welw. herb. no. 38). No. **526**.

The specimens that are not provided with fruit are difficult to distinguish from the subspecies *C. submersum* L. Sp. Pl., edit. 2, p. 1409 (1763).

Page 810, line 23. For "*Loranthus Buchneri* Engl.," read "*L. sessilifolius* P. Beauv."

Page 824, lines 11 to 23. Substitute the following:—

1. **Ecbolium Clarkei** Hiern, sp. n.

E. amplexicaule C. B. Cl. in Fl. Trop. Afr. v. p. 237 (1900), partly; not of S. Moore in Journ. Bot. 1894, p. 136. *Justicia* sp., S. Moore, *l.c.*, 1880, p. 342.

An undershrub, 2 to 4 ft. high; branches erect-patent, glabrescent or towards the apex puberulous, glaucescent; leaves oval- or ovate-oblong, more or less obtusely narrowed at the apex or the upper ones rather acute, broad subcordate-truncate and often somewhat hastate-auriculate at the subsessile base, not panduriform, chartaceous, glabrous or glabrescent, greenish-glaucescent, pallid beneath, $1\frac{1}{2}$ to $4\frac{3}{4}$ in. long, by $\frac{3}{4}$ to 2 in. broad; petioles $\frac{1}{30}$ to $\frac{1}{10}$ in. long, rather broad, fleshy, jointed to the branchlets at the nodes; spikes terminal, 2 to 4 in. long, shortly pedunculate; bracts oval or ovate, acutely cuspidate or acuminate at the apex, narrowed or nearly rounded but not cordate at the subsessile base, puberulous, $\frac{2}{3}$ to 1 in. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad; calyx puberulous, $\frac{1}{6}$ in. long, bibracteolate; bracteoles narrow, rather shorter than the calyx; corolla elongate-funnelshaped, $1\frac{1}{2}$ in. long; the tube for the most part very slender and outside pubescent with spreading-deflected hairs, somewhat dilated towards the base, funnel-shaped at the apex; limb bilabiate; the anterior lip $\frac{1}{2}$ in. long, with three oval obtuse segments, the middle segment $\frac{1}{4}$ to $\frac{5}{16}$ in. broad, the lateral segments $\frac{3}{16}$ to $\frac{1}{5}$ in. broad; the posterior lip sublinear, bifid at the apex, obtuse, $\frac{3}{16}$ in. long, $\frac{1}{20}$ in. broad; stamens 2, inserted at the throat of the corolla or a little below; anthers bilocular, $\frac{1}{12}$ in. long, glabrous; the cells parallel, one of them a very little higher than the other, minutely mucronate at the base; pollen (according to C. B. Clarke ms.) subglobose, smooth, with the meridional slits narrow, very short and not nearly reaching the pole; ovary bilocular, shortly hairy; stigma bifid, terminating the very long style; capsule $\frac{1}{2}$ to 1 in. long, laterally compressed, puberulous; seeds 2, compressed, smooth, not tuberculate, obliquely subrotund, somewhat thickened around the margin, emarginate at the hilum, $\frac{1}{4}$ in. in diameter or rather more, glabrous, usually pallid.

Loanda.—In sandy thickets near Penedo, and in public but little frequented places in the city of Loanda; fl. and fr. Dec. 1858. Nos. **5203, 5124.**

Also common at Ambriz, where it was collected by Monteiro in Nov. 1872.

The distinctness of this plant from the type of *S. amplexicaulis* has been pointed out to me by Mr. S. Moore.

Page 837, line 16. For "**Vitex huillensis** Hiern, sp. n.," read "**V. grisea** Baker in Fl. Trop. Afr. v. 325 (1900)."

Page 873, line 15. For **5830** read **5530.**

INDEX.

Abena, 830.
Acalypha, 976.
Acalypha, 980.
Acanthodium, 812, 813.
Acanthus, 813.
Acanthus, 814.
Achyranthes, 893.
Achyranthes, 890-4, 896.
Achyrospermum, 874.
Acidoton, 961.
Acrocephalus, 855.
Acrostachys, 927.
Acrostephanus, 927.
Adhatoda, 819, 822.
Adicea, 990.
Æolanthus, 868.
Ærua, 893.
Aërva, 892.
Ærva, 893.
Agelanthus, 927.
Agrostistachys, 973.
Ajuga, 881.
Alchornea, 979.
Alternanthera, 895.
Alvesia, 872.
Amaranthus, 886.
Amarantus, 886.
Anisochlamys, 972.
Anonymos, 805.
Anthadenia, 797.
Anthocometes, 819.
Antiaris, 1020.
Antidesma, 965.
Aphyteia, 910.
Apodanthes, 908.
Aristolochia, 911.
Arthrocnemum, 890.
Arthrosolen, 922.
Arthrothamnus, 944.
Artocarpus, 1021.
Asystasia, 817.
Atriplex, 899.
Averrhoa, 960.
Avicennia, 847.

Barleria, 814.
Barleria, 810, 825.
Basella, 897.
Basilicum, 857.
Beta, 899.
Bignonia, 790-2.
Blepharis, 811.
Boerhaavia, 882.
Boerhavia, 882.
Böhmeria, 992.
Bontia, 847.
Bosqueia, 1019.
Bosquiea, 1019.
Bougainvillæa, 883.
Brachystephanus, 819.
Bridelia, 953.
Briedelia, 953.
Brillantaisia, 807.
Brochoneura, 914.
Brunnichia, 905.
Bucholzia, 895.
Buginvillæa, 883.
Buxus, 952.

Calamintha, 874.
Calophanes, 807.
Candelabria, 954.
Canella, 914.
Cannabis, 994.
Cassyta, 915.
Cassytha, 915.
Catophractes, 793.
Celosia, 884.
Celtis, 1027.
Celtis, 1029, 1030.
Centema, 889.
Centrogyne, 1019.
Ceratogonon, 902, 903.
Ceratogonum, 902.
Ceratophyllum, 1031.
Ceratotheca, 800.
Chætachme, 1030.
Chætacme, 1030.
Chamædryfolia, 994.
Charachera, 829.
Cheilopsis, 813.
Chenopodium, 897.
Chenopodium, 900.
Chlorophora, 1026.
Cicca, 960.
Cinnamomum, 914.
Claoxylon, 975.
Claoxylon, 980.
Cleistanthus, 955.
Clerodendron, 839.
Clerodendrum, 839.
Clinopodium, 874.
Clinopodium, 876.
Clutia, 973.
Clutia, 955.
Cluytia, 955, 973.
Cluytiandra, 956.
Coleus, 865.
Comacum, 913.
Condea, 872.
Crescentia, 793.
Croton, 969.
Croton, 969, 980.
Curcas, 968.
Cyathula, 889, 890, 893.
Cyatula, 893.
Cyclonema, 844.
Cyclostemon, 961.
Cyphocarpa, 889.

Dalechampia, 985.
Desmochæta, 890.
Desmochæta, 891.
Dianthera, 820, 822, 824.
Diapedium, 825.
Diasperus, 957-60.
Dicliptera, 825.
Diplopyramis, 902.
Dischistocalyx, 809.
Dolichandrone, 791.
Dondia, 900.
Dorstenia, 1025.
Dorstenia, 1024.
Dufourea, 907.
Duranta, 831.
Dyschoriste, 807.

Ecbolium, 824, 1032.
Elatostema, 992.
Elytraria, 805.
Englerastrum, 860.
Eranthemum, 818.
Euphorbia, 940.
Euxolus, 888.
Excœcaria, 986.
Excœcaria, 986.

Faurea, 921.
Ferdinanda, 792.

Ferdinandia, 792.
Ferdinandoa, 792.
Fernandia, 792.
Fernandoa, 792.
Ficus, 996.
Ficus, 1022.
Fleurya, 988.
Fluggea, 961.
Forskahlea, 994.
Forskohlea, 994.
Frostia, 908.
Fusanus, 938.

Geniosporum, 852.
Geniosporum, 854, 861.
Genlisea, 789.
Germanea, 860.
Girardinia, 990.
Globularia, 826.
Gnidia, 922.
Gnidiopsis, 922.
Gomphrena, 884, 896, 897.
Gongyla, 800.

Haaslundia, 860.
Hasskarlia, 974.
Hebenstreitia, 825.
Hebenstretia, 825.
Heckeria, 911.
Hemizygia, 851.
Hermbstædtia, 886.
Hermstædtia, 886.
Hernandia, 915.
Herniaria, 883.
Heterophragma, 792.
Hiernia, 806.
Hillera, 901.
Hilleria, 900.
Hoslundia, 860.
Hydnora, 910.
Hygrophila, 806.
Hymenocardia, 966.
Hypoëstes, 824.
Hypoëstes, 820.
Hyptis, 872.

Ichnocarpus, 891.
Illecebrum, 892, 896, 897.
Intrusaria, 817.
Ipo, 1020.
Iresine, 893, 897.
Isochoriste, 818.

Jatropha, 968.
Jatropha, 973.
Justicia, 819.
Justicia, 805, 817, 819, 822-5, 1032.

Kaluhaburunghos, 955.
Kigelia, 793.
Kigelkeia, 793.
Kirganelia, 957.

Lantana, 827.
Lantana, 829, 830.
Laportea, 987.
Lasiocorys, 876.
Lasiosiphon, 922.
Laurus, 914.
Lavandula, 873.
Leonotis, 879.
Lepidagathis, 819.
Lepidocarpus, 917.
Lepidoturus, 980.
Lerchea, 900.
Lerchia, 900.
Leucadendron, 917.
Leucas, 876.
Leucas, 872.
Leucorhaphis, 807.
Linariopsis, 801.
Lippia, 829.
Loranthus, 927, 1032.
Lumnitzera, 857.
Lyama, 891.
Lytanthus, 826, 827.

Macaranga, 981.
Maclura, 1026.
Marcellia, 888.
Mallotus, 980.
Manihot, 973.
Manniophyton, 972.
Mappa, 981.
Maprounea, 985.
Margarocarpus, 992
Markhamia, 791.
Martynia, 801.
Mercurialis, 976.
Melissa, 874.
Mentha, 873.
Mesosphærum, 872.
Metula, 927.
Micranthus, 811.
Micrococca, 976.
Microdesmis, 967.
Micropiper, 912.
Mirabilis, 881.
Mohlana, 900.
Monechma, 822.
Monothecium, 819.
Morus, 1027.
Morus, 1026.
Moschosma, 857.
Muenteria, 791.
Musanga, 995.
Myrianthus, 995.
Myrica, 1030.
Myriopeltis, 1022.
Myristica, 913.

Nelsonia, 805.
Neoboutonia, 980.
Neomüllera, 865.
Nepeta, 873.
Neuracanthus, 817.
Neuracanthus, 819.
Newbouldia, 790.
Nicoteba, 820.
Nomaphila, 806.
Nothosærva, 892.
Nothosærua, 892.

Ocimum, 848, 851, 855, 857.
Ocymum, 848, 854.
Oldfieldia, 963.
Oncocalyx, 927.
Origanum, 874.
Orthosiphon, 858.
Osyris, 938.
Ouret, 893.
Ovieda, 839.
Oxygonum, 902.

Paivæusa, 963.
Pandiaka, 894.
Parietaria, 994.
Paronychia, 883.
Paronychia, 884.
Pechuelia, 826.
Peperomia, 912.
Persea, 915.
Persicaria, 903.
Peristrophe, 824.
Petalidium, 809.
Phaulopsis, 811.
Phaylopsis, 811.
Philoxerus, 897.
Phlomis, 876, 879.
Phragmanthera, 927.
Phyla, 829, 830.
Phylanthus, 957, 961.
Phyllanthus, 957.
Phyllanthus, 961.
Phytolacca, 901.
Pilea, 990.
Pilostyles, 908.
Piper, 911.
Piper, 912.
Pircunia, 901, 902.

Plantago, 881.
Platostoma, 854.
Platystoma, 854.
Plectranthus, 860, 867, 871.
Pollichia, 883.
Polygonum, 903.
Pothomorphe, 911.
Pouzolzia, 992.
Premna, 831.
Pretrea, 801.
Protea, 917.
Protæa, 917.
Pseudanthus, 892.
Pseuderanthemum, 818.
Pseudobarleria, 809, 810.
Pseudoblepharis, 814.
Psilotrichum, 889.
Psilotrichum, 894.
Pterodiscus, 795.
Pupal, 891.
Pupalia (Mart.), 890.
Pupalia (Juss.), 891.
Pycnanthus, 913.
Pycnocoma, 983.

Rademachia, 1021.
Raphanopsis, 902.
Rhinacanthus, 823.
Ricinocarpus, 976-9.
Ricinodendron, 971.
Ricinus, 983.
Rima, 1021.
Rivina, 900, 901.
Rogeria, 796.
Rostellularia, 820.
Rottlera, 980.
Ruellia, 808.
Ruellia, 807, 818.
Rumex, 905.

Saccus, 1022.
Salicornia, 899, 900.
Salix, 1030.
Salsola, 900.
Salsola, 900.
Salvia, 874.
Sapium, 986.
Schousbœa, 979.
Sclerocephalus, 884.
Sclerochiton, 814.
Securinega, 961.
Selago, 826.
Septimetula, 927.
Sericocoma, 888, 889.
Sericocomopsis, 889.
Sesamopteris, 800.
Sesamothamnus, 796.
Sesamum, 797.
Siphonanthus, 839.
Siphonoranthemum, 818.
Sitodium, 1022.
Soccus, 1021.
Solenostemon, 863.
Sotor, 793.
Spathodea, 791.
Spathodea, 790-2.
Spinacia, 897.
Spironema, 844.
Sponia, 1029.
Stachys, 874.
Stachytarpha, 830.
Stachytarpheta, 830.
Stauntia, 914.
Stenolobium, 790.
Streptocarpus, 789.
Sucæda, 900.
Syama, 891.
Sycomorus, 1012, 1014, 1016.
Sycophila, 927.
Symphostemon, 867.

Tanæcium, 793.
Tanarius, 981, 982.
Tapinanthus, 927.
Tecoma, 790.
Telanthera, 895.
Thecacoris, 967.
Thesium, 936.
Thunbergia, 801.
Tinnea, 879.
Tithymalus, 950, 952.
Tragia, 984.
Tragia, 976.
Treculia, 1022.
Trema, 1029.
Trema, 1028.
Trichostachys, 921.
Tripinnaria, 793.
Tristicha, 907.
Trymatococcus, 1024.
Tubiflora, 805.

Uapaca, 963.
Urera, 986.
Uretia, 893.
Urostigma, 1002, 1003, 1005.
Urtica, 988-92.
Urticastrum, 987.
Utricularia, 785.

Valeriana, 883.
Valerianodes, 830.
Valerianoides, 830.
Verbena, 829-31.
Viscum, 935.
Vitex, 834, 1032.
Volkameria, 797—800, 839.

Whitfieldia, 811.

Xylophylla, 961.

Printed by Hazell, Watson, & Viney, Ld., London and Aylesbury.

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Dates of Publication of the Several Parts of this Volume.

Part	I., pp. i—xxvi, 1—336,	was published	*Dec.* 1896.
,,	II., pp. 337—510,	,, ,,	*March* 1898.
,,	III., pp. 511—784,	,, ,,	*Dec.* 1898.
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Director.

British Museum
(Natural History),
Cromwell Road,
London, S.W.
July 1st, 1900.

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
By DARLING & SON, Ltd., 34-40, Bacon Street, E.

1900.